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U. S. DEPARTMENT OF AGRICULTURE,

U. S. WEATHER BUREAU.

BULLETIN K.

1501

STORMS OF THE GREAT LAKES.

122570

BY

E. B. GARRIOTT,

PROFESSOR OF METEOROLOGY.

Prepared under direction of WILLIS L. MOORE, Chief U. S. Weather Bureau.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU,
Washington, D. C., October 20, 1902.

HON. JAMES WILSON,
Secretary of Agriculture, Washington, D. C.

SIR: I have the honor to transmit herewith a paper by Prof. Edward B. Garriott entitled Storms of the Great Lakes.

This paper presents 952 charts that describe graphically 238 of the more important storms that visited the Great Lakes during the 25-year period 1876 to 1900.

The purpose of the compilation is to furnish observers of the Weather Bureau and shipmasters a handy reference which will aid them to recognize on the daily weather maps the general atmospheric conditions that attend the approach of lake storms.

I recommend the publication of this paper as a bulletin of the Weather Bureau.

Very respectfully,

WILLIS L. MOORE,
Chief U. S. Weather Bureau.

Approved:
J. H. BRIGHAM,
Acting Secretary.

STORMS OF THE GREAT LAKES.

The accompanying charts present graphically the more important storms of the Great Lakes that have been described in the Monthly Weather Review during the 25-year period 1876 to 1900, inclusive. Each storm is illustrated by four charts that cover thirty-two to forty-eight hours of its history, and as a rule at least two of the charts present general meteorological conditions that • obtained over the United States and Canada at observations taken eight to twenty-four hours before the storm center reached the Lake region.

The standard of intensity observed in selecting the storms varies with the seasons; the object has been simply to present typical lake storms of the various months that have been of sufficient strength to endanger shipping. A classification of these storms with regard to types and a study of the characteristics and relative seasonal frequency of the several types will, it is believed, be of interest and value to all persons interested in lake navigation, and the official forecaster will find that the charts present a record for ready reference that can be used to advantage in his daily work. As a means of classifying the storms the pages containing the charts can be rearranged and storms of similar types grouped; or the charts can be pasted on card board, cut to a corresponding size, and filed in the form of a card index.

SEASONAL FREQUENCY OF LAKE STORMS.

November, with a total of 45 severe storms in twenty-five years, is the month of greatest storm frequency on the Great Lakes. October, November, and December have each an average of more than one and less than two severe storms. Next in order come September and March, with 23 and 22 storms, respectively. In June and August severe storms occur about once in three years and in July about once in four years. It appears from these figures that as the season of navigation approaches its close the storms increase in number and also, as a rule, in severity, and that, as a forecasting feature, the severe straight gales of summer are an almost negligible quantity.

TYPES AND INTENSITY OF LAKE STORMS—SOUTHWEST STORMS.

The most destructive storms of the Great Lakes come from the Southwest. As a rule storms of this class first appear in the region that embraces the southeast slope of the Rocky Mountains, the Rio Grande Valley, the coast districts of northeastern Mexico, and the west part of the Gulf of Mexico. They appear at times to have their origin in an atmospheric eddy that is formed over the region referred to by the meeting of warm, moist winds from the Gulf of Mexico and cold north to northwest winds that blow down the eastern slope of the Rocky Mountains. In some instances storms that appear on the southeastern slope of the Rocky Mountains are clearly secondary developments to areas of low barometric pressure that are moving eastward in northern latitudes. In the late summer and early autumn months storms from the west part of the Gulf of Mexico are sometimes of West Indian origin. Occasionally storms advance from the southern California coast over the southern Rocky Mountains and the Rio Grande Valley, and it is believed that they sometimes pursue a more southerly course from the Mexican Pacific coast to the Rio Grande Valley. The season of southwest storms extends from October to May; those that advance from that region during the warmer months are usually of tropical origin. The approach of storms of the southwest type is generally indicated in the Lake region twelve to twenty-four hours in advance of their arrival by falling barometer and east to northeast winds. As the storm center approaches the middle Mississippi or Ohio rivers the barometer falls rapidly and the wind gradually increases to gale force. Following the passage of the storm center the wind shifts suddenly to northwest and the barometer rises

rapidly. The gales that attend these storms are particularly dangerous on the United States side of the Great Lakes where they come as onshore winds, and in the winter months the danger is frequently added to by heavy falls of snow and subsequent intense cold.

STORMS FROM THE MIDDLE-WEST.

Next in order as regards severity are storms that advance from the States of the lower Missouri Valley over the Great Lakes. These storms first appear on the middle-eastern slope of the Rocky Mountains and move north of east, or swing southeastward from the Northwestern States or the north Pacific coast and recurve east and north of east over the lower Missouri Valley or the States of the middle-west. They frequently develop dangerous strength while crossing the lower Missouri or upper Mississippi valleys, and this is especially true of storms that advance from the Northwest, recurve north of east over Iowa, and pass thence over the Lake region. At times this development is so sudden that alertness on the part of the forecaster to detect the conditions favorable to an increase in intensity and promptness to act on the part of that official is necessary to forewarn lake interests of their approach. Storms of this class are also attended during the colder months by snow but the snowfalls are not, as a rule, so heavy as those that attend storms from the Southwest. The approach of storms from the lower Missouri Valley and the middle-west is generally indicated at points on the Great Lakes twelve to twenty-four hours before gales begin by east to southeast winds, falling barometer, fleecy upper clouds moving from a westerly direction that gradually become obscured by lower clouds that move, with increasing velocity, first from the south and later from the east quadrants. When the barometer begins to fall rapidly and the wind freshens and shifts to easterly points no time should be lost in seeking shelter by vessels that are liable to be damaged by easterly gales. Following the passage of the center of a storm of this class the barometer rises and the wind shifts suddenly to northwest and gradually diminishes in force with clearing weather. In winter, however, light snow will sometimes continue several hours after the center of the storm has passed to the eastward. This is particularly true in cases where the passage of the storm center is followed by a cold wave. While storms from the middle-west are common to all seasons of the year the severer types of this class that endanger lake shipping are confined principally to the colder months.

NORTHWEST STORMS.

The class to which the greater number of lake storms belong includes all disturbances that move from the northeast Rocky Mountain slope and the British Northwest Territory almost directly toward the upper lakes. During the colder months many of these storms advance from the North Pacific Ocean. Disturbances of the northwest type are seldom very severe or destructive over the Lake region. They are preceded in all seasons by falling barometer and southerly winds that set in twenty-four hours or more before the storm center reaches the lakes. The force of the south to southwest winds that attend the approach of a storm from the Northwest depends upon the depth of the barometric depression and the gradient it presents. On the United States side of the Great Lakes, with the exception of Lake Michigan, they are, however, offshore winds. Following the passage of the center of a northwest storm the wind at points on the Great Lakes shifts to west and northwest and diminishes in force and the barometer rises rapidly. In winter the precipitation that attends storms of this class is generally light, and heavy snow seldom, if ever, falls south of the track of the storm center. In summer the rain that falls usually comes in the form of thunderstorms and the high winds in squalls from the Southwest at the time the center of the storm is passing.

STORMS OF TROPICAL ORIGIN.

Some of the severest storms of the Great Lakes have been of tropical origin. Fortunately this class of storms has been of exceedingly rare occurrence, and when they have occurred their advance

from the Gulf of Mexico or the south Atlantic coast of the United States has been abundantly indicated by the general meteorological conditions that have attended and preceded their advance.

The following table shows the dates of storms that are illustrated on the charts herewith. As previously stated these storms, as a rule, receive special mention in the Monthly Weather Review, and are considered typical storms of the various classified types. The Wind Barometer Table for the Great Lakes was prepared by the writer a number of years ago. The Table of Maximum Wind Velocities is from the Meteorological Chart of the Great Lakes and gives, by months, the highest wind velocities ever recorded during the season of navigation at the various Weather Bureau stations of the Great Lakes.

January, 1876.....	8-9	March, 1890.....	26-28	May, 1898.....	17-19
1880.....	21-22	1891.....	2-4		
1881.....	20-21	1893.....	10-11	Total number	15
1882.....	25-26	1894.....	10-11		
1883.....	19-20	1895.....	3-4	June, 1876.....	16-17
1884.....	1-2	1896.....	27-29	1877.....	8-9
1885.....	5-6	1897.....	8-9	1878.....	19-20
1885.....	10-11	1897.....	10-11	1880.....	5-6
1885.....	15-16	1897.....	18-19	1882.....	2-3
1886.....	3-4	1898.....	21-22	1882.....	17-18
1887.....	16-17	1898.....	26-27	1892.....	22-23
1889.....	8-9			1893.....	20-21
1890.....	12-13	Total number	22	1897.....	1-2
1893.....	8-9				
1895.....	20-21	April, 1876.....	4-5	Total number	9
1895.....	25-26	1878.....	9-10		
Total number	16	1879.....	1-2	July, 1876.....	4-5
February, 1876.....	1	1879.....	9-10	1878.....	24-26
1878.....	21-22	1880.....	18-19	1885.....	15-17
1880.....	11-12	1883.....	9-10	1891.....	15-17
1881.....	9-10	1884.....	14-15	1897.....	20-21
1881.....	11-12	1884.....	27-28	1898.....	18-19
1884.....	18-19	1886.....	6-7		
1885.....	9-10	1887.....	3-4	Total number	6
1887.....	25-26	1887.....	17-18		
1888.....	23-24	1887.....	22-23	August, 1878.....	12-14
1889.....	3-4	1890.....	8-9	1883.....	21-22
1892.....	6-7	1893.....	19-20	1885.....	1-3
1893.....	1-2	1897.....	17-19	1885.....	20-21
1893.....	27-28	1898.....	12-13	1889.....	19-21
1898.....	18-19			1891.....	16-17
		Total number	16	1892.....	29-30
Total number	14			1893.....	28-29
March, 1876.....	15-16	May, 1876.....	2-3		
1876.....	24-25	1878.....	19-20	Total number	8
1877.....	1-2	1884.....	1-2		
1878.....	2-3	1887.....	1-2	September, 1876.....	17-18
1880.....	4-5	1889.....	26-27	1878.....	12-13
1880.....	26-27	1890.....	9-10	1878.....	19-20
1881.....	18-19	1890.....	15-16	1879.....	2-3
1882.....	8-9	1892.....	2-3	1880.....	19-20
1882.....	20-21	1892.....	18-19	1880.....	27-28
1884.....	10-11	1893.....	14-15	1881.....	9-10
1885.....	13-14	1894.....	16-17	1881.....	28-29
		1896.....	16-17	1882.....	13-14
		1896.....	24-25	1883.....	23-24
		1896.....	26-27	1884.....	23-24

September, 1885.....	7-8	October, 1898.....	24-25	November, 1898.....	21-22
1888.....	25-26			1900.....	12-13
1889.....	18-19	Total number	29	1900.....	18-19
1891.....	14-15			1900.....	20-21
1891.....	27-28	November, 1876.....	1-2		
1892.....	13-14	1877.....	1-2	Total number	45
1894.....	21-22	1877.....	7-8		
1895.....	27-28	1878.....	5-7	December, 1876.....	7-9
1896.....	29-30	1879.....	1-2	1876.....	28-29
1899.....	23-24	1879.....	18-20	1877.....	4-5
1899.....	27-28	1879.....	27-28	1878.....	9-10
1900.....	10-11	1880.....	5-7	1878.....	20-21
		1880.....	19-20	1879.....	9-10
Total number	23	1881.....	11-12	1879.....	21-22
		1881.....	18-19	1880.....	4-5
October, 1876.....	12-14	1882.....	27-29	1883.....	23-24
1877.....	2-4	1883.....	10-11	1883.....	26-27
1878.....	8-9	1883.....	25-26	1884.....	5-6
1879.....	21-23	1884.....	3-8	1884.....	14-15
1879.....	28-29	1884.....	22-23	1884.....	21-22
1880.....	15-17	1885.....	6-7	1885.....	3-4
1881.....	11-12	1885.....	11-12	1885.....	8-9
1881.....	14-15	1886.....	16-18	1886.....	1-2
1882.....	8-9	1886.....	22-23	1886.....	3-4
1883.....	12-14	1887.....	18-19	1888.....	4-5
1883.....	28-29	1889.....	26-27	1888.....	24-25
1884.....	7-8	1891.....	10-11	1890.....	10-11
1884.....	20-21	1891.....	15-16	1890.....	27-29
1884.....	23-25	1891.....	20-21	1891.....	3-4
1885.....	28-29	1891.....	25-26	1892.....	7-8
1886.....	13-14	1892.....	6-7	1892.....	12-13
1887.....	1-3	1892.....	16-17	1893.....	14-15
1887.....	22-24	1893.....	21-22	1894.....	9-10
1889.....	4-5	1894.....	1-2	1894.....	11-12
1890.....	12-13	1894.....	8-10	1895.....	24-25
1891.....	24-26	1894.....	25-26	1895.....	29-30
1891.....	30-31	1895.....	24-26	1896.....	12-13
1892.....	27-29	1896.....	2-3	1898.....	3-5
1893.....	13-14	1896.....	4-5	1899.....	10-12
1894.....	28-29	1897.....	4-5	1900.....	3-4
1894.....	30-31	1897.....	8-9	1900.....	7-8
1896.....	29-31	1897.....	10-11	1900.....	22-23
1898.....	17-18	1898.....	1-2		
		1898.....	4-5	Total number	35
		1898.....	7-8		

Summary of the number of severe storms that visited the Great Lakes from 1876 to 1900, inclusive:

Month.	Number of storms.	Month.	Number of storms.
January.....	16	August.....	8
February.....	14	September.....	23
March.....	22	October.....	29
April.....	16	November.....	45
May.....	15	December.....	35
June.....	9		
July.....	6	Total.....	238

WIND BAROMETER TABLE FOR THE GREAT LAKES.

Height of barometer (lake level).	Direction of wind.	Character of weather and wind indicated.
29.40 to 29.60, and steady.....	West.....	Fair, slight changes in temperature, gentle to fresh winds.
29.40 to 29.60, rising.....	West.....	Fair, cooler, fresh west to northwest winds.
29.40 to 29.60, falling.....	South.....	Warmer, increasing southerly winds.
29.60, or above, falling rapidly.....	East to south.....	Warmer, rain or snow within 36 hours, increasing east to southeast winds.
29.60, or above, rising rapidly.....	West to north.....	Cool and clear, quickly followed by warmer, variable winds.
29.60, or above, steady.....	Variable.....	No immediate change, but winds will go to south inside of 36 hours.
29.40, or below, falling slowly.....	South to east.....	Rain or snow, increasing easterly winds.
29.40, or below, falling rapidly.....	South to east.....	Rain or snow, high easterly winds, followed within 48 hours by clearing, cooler, west to northwest winds.
29.40, or below, rising slowly.....	South to west.....	Clearing, cooler, fresh to brisk west to northwest winds.
29.20, or below, falling rapidly.....	South to east.....	Severe storm of wind and rain, and wind shifting to northwest within 36 hours.
29.20, or below, falling rapidly.....	East to north.....	Severe northeaster, with heavy rain or snow, and winds backing to northwest.
29.20, or below, rising rapidly.....	Going to west.....	Clearing and cooler, probably cold wave in winter.

MAXIMUM WIND VELOCITIES IN THE LAKE REGION.

(From Meteorological Chart of the Great Lakes.)

Stations.	April.				May.				June.				July.				August.			
	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.
Lake Superior :																				
Duluth	58	ne.	1883	22	60	ne.	1877	20	48	sw.	1880	24	48	nw.	1897	2	50	nw.	1897	8
Marquette	49	w.	1891	30	52	se.	1896	25	45	se.	1899	13	68	sw.	1901	20	48	sw.	1890	22
Sault Ste. Marie.....	60	se.	1898	20	50	se.	1892	18	45	nw.	1898	1	42	nw.	1898	28	50	nw.	1897	29
Lake Michigan :																				
Mackinaw City	46	se.	1887	12	52	e.	1883	10	47	se.	1887	17	37	sw.	1887	30	38	sw.	1883	20
Escanaba	48	n.	1878*	10	38	n.	1879*	25	40	s.	1876	17	37	nw.	1901	20	44	n.	1875	20
Green Bay	48	w.	1892	2	48	n.	1894	18	41	sw.	1901	28	48	sw.	1898	19	42	sw.	1888	8
Milwaukee	54	sw.	1878	10	49	se.	1896	25	60	sw.	1880	4	60	sw.	1874	24	52	w.	1896	9
Chicago	72	ne.	1893	20	62	e.	1894	18	72	nw.	1892	13	72	w.	1897	5	72	sw.	1898	16
Grand Haven.....	44	nw.	1882	19	42	w.	1898	19	48	nw.	1879	27	48	sw.	1895	16	48	nw.	1896	10
Lake Huron :																				
Alpena	49	nw.	1898	4	43	sw.	1896	17	48	w.	1881	13	60	sw.	1875	15	41	nw.	1901	29
Port Huron	60	sw.	1898	13	54	sw.	1896	17	52	w.	1898	12	56	n.	1879	11	52	n.	1896	8
Lake Erie :																				
Detroit	72	ne.	1898	20	74	sw.	1893	23	60	nw.	1890	17	54	n.	1893	7	37	nw.	1896	11
Toledo	60	w.	1892	5	52	e.	1882	6	50	w.	1888	13	49	nw.	1892	24	45	ne.	1875	1
Sandusky	52	nw.	1880	19	46	nw.	1878	10	57	nw.	1882	29	69	n.	1879	11	63	ne.	1885	9
Cleveland	60	n.	1901	20	60	sw.	1893	23	60	nw.	1898	12	66	w.	1896	26	58	nw.	1896	10
Erie	60	se.	1894	10	60	s.	1875	23	40	w.	1899	7	56	w.	1876	40	40	w.	1895	28
Buffalo	57	sw.	1897	20	58	sw.	1884	2	56	sw.	1893	11	60	sw.	1876	5	51	w.	1898	3
Lake Ontario :																				
Rochester	62	w.	1892	13	60	w.	1884	2	44	w.	1888	6	52	nw.	1888	11	48	ne.	1893	29
Oswego	54	se.	1893	20	40	se.	1894	20	36	ne.	1885	5	38	n.	1888	11	51	n.	1893	29
Stations.	September.				October.				November.				December.							
	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.	Vel.	Dir.	Year.	Date.				
Lake Superior :																				
Duluth	78	ne.	1881	16	55	ne.	1896	30	56	nw.	1896	21	60	sw.	1874	16	60	sw.	1874	16
Marquette	61	s.	1893	21	46	n.	1892	28	48	sw.	1894	14	54	w.	1876	9	54	w.	1876	9
Sault Ste. Marie.....	45	sw.	1901	15	50	nw.	1893	14	52	nw.	1896	18	54	nw.	1901	31	54	nw.	1901	31
Lake Michigan :																				
Mackinaw City	39	w.	1887	6	57	e.	1887	23	53	e.	1886	17	60	se.	1887	31	60	se.	1887	31
Escanaba	40	n.	1875*	9	45	sw.	1880	16	60	n.	1877	8	54	n.	1873	3	54	n.	1873	3
Green Bay	52	nw.	1893	15	48	nw.	1892	28	40	n.	1892	17	38	sw.	1891	5	38	sw.	1891	5
Milwaukee	48	w.	1890	20	60	sw.	1880	16	51	nw.	1883	11	56	sw.	1873	4	56	sw.	1873	4
Chicago	72	sw.	1900	11	63	se.	1898	19	76	s.	1898	7	60	sw.	1894	16	60	sw.	1894	16
Grand Haven.....	60	nw.	1878	19	55	sw.	1876	9	52	nw.	1882*	23	66	sw.	1876	15	66	sw.	1876	15
Lake Huron :																				
Alpena	48	w.	1884	10	42	nw.	1874	29	50	sw.	1874	5	72	sw.	1873	4	72	sw.	1873	4
Port Huron	46	s.	1878	20	54	sw.	1887	24	58	sw.	1895	26	67	sw.	1889	29	67	sw.	1889	29
Lake Erie :																				
Detroit	43	sw.	1900	11	61	nw.	1891	31	76	sw.	1895	26	51	sw.	1890	23	51	sw.	1890	23
Toledo	60	s.	1896	24	52	se.	1901	12	60	sw.	1895	26	48	sw.	1889	29	48	sw.	1889	29
Sandusky	52	nw.	1897	16	54	n.	1885	29	62	nw.	1879	20	56	nw.	1885	5	56	nw.	1885	5
Cleveland	66	nw.	1897	16	62	nw.	1894	11	73	s.	1895	26	60	w.	1898	5	60	w.	1898	5
Erie	45	sw.	1895	12	48	w.	1887	24	54	w.	1891	23	52	s.	1875	...	52	s.	1875	...
Buffalo	78	w.	1900	12	66	w.	1887	24	80	w.	1900	21	78	w.	1895	31	78	w.	1895	31
Lake Ontario :																				
Rochester	56	w.	1882	14	56	sw.	1887	24	55	s.	1883	26	54	w.	1889	22	54	w.	1889	22
Oswego	51	nw.	1892	26	56	se.	1893	14	48	w.	1900	21	52	w.	1889	26	52	w.	1889	26

* And other years.

Chart I.

January 8, 1876—7:35 a. m.

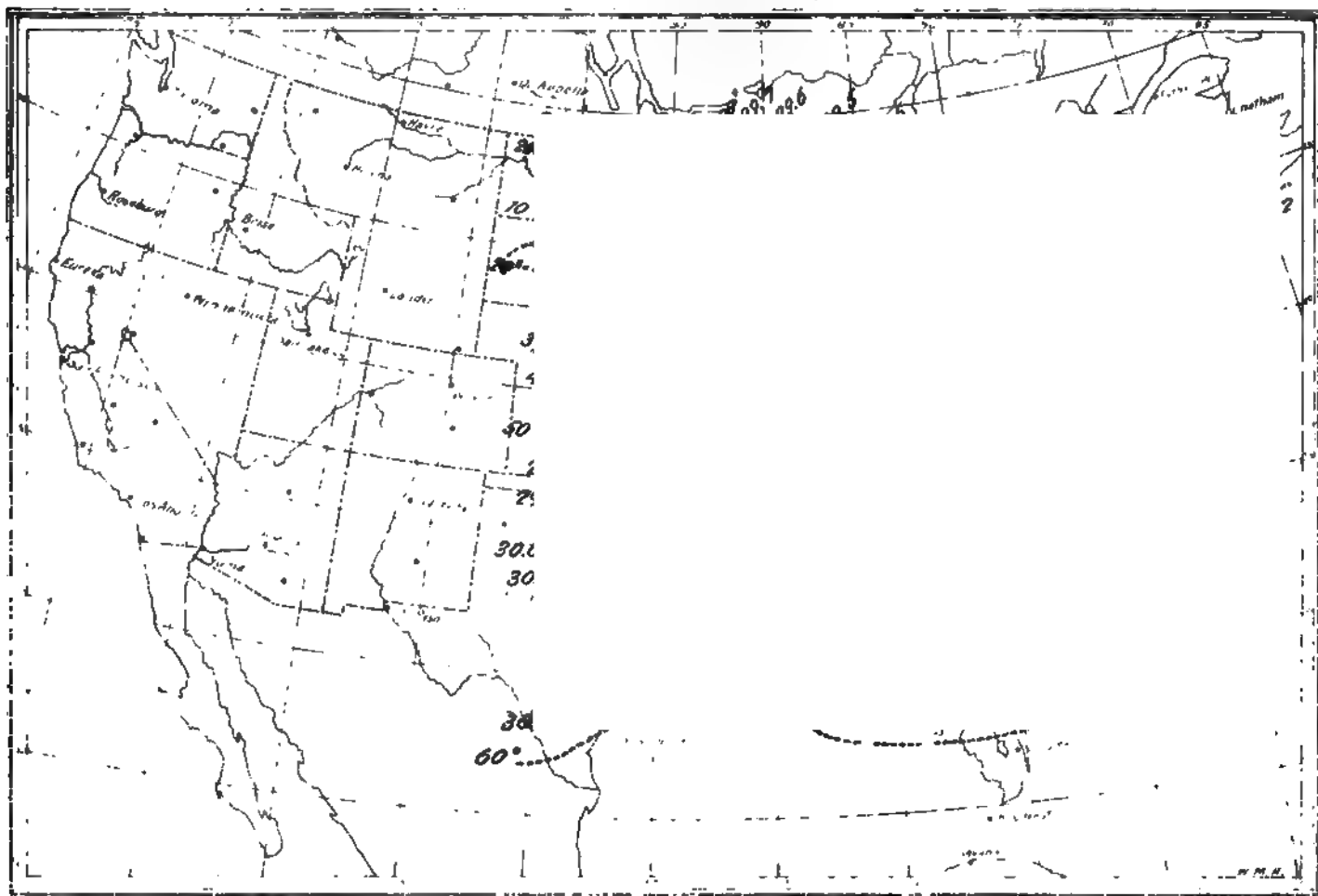


Chart II.

January 8, 1876—11 p. m.

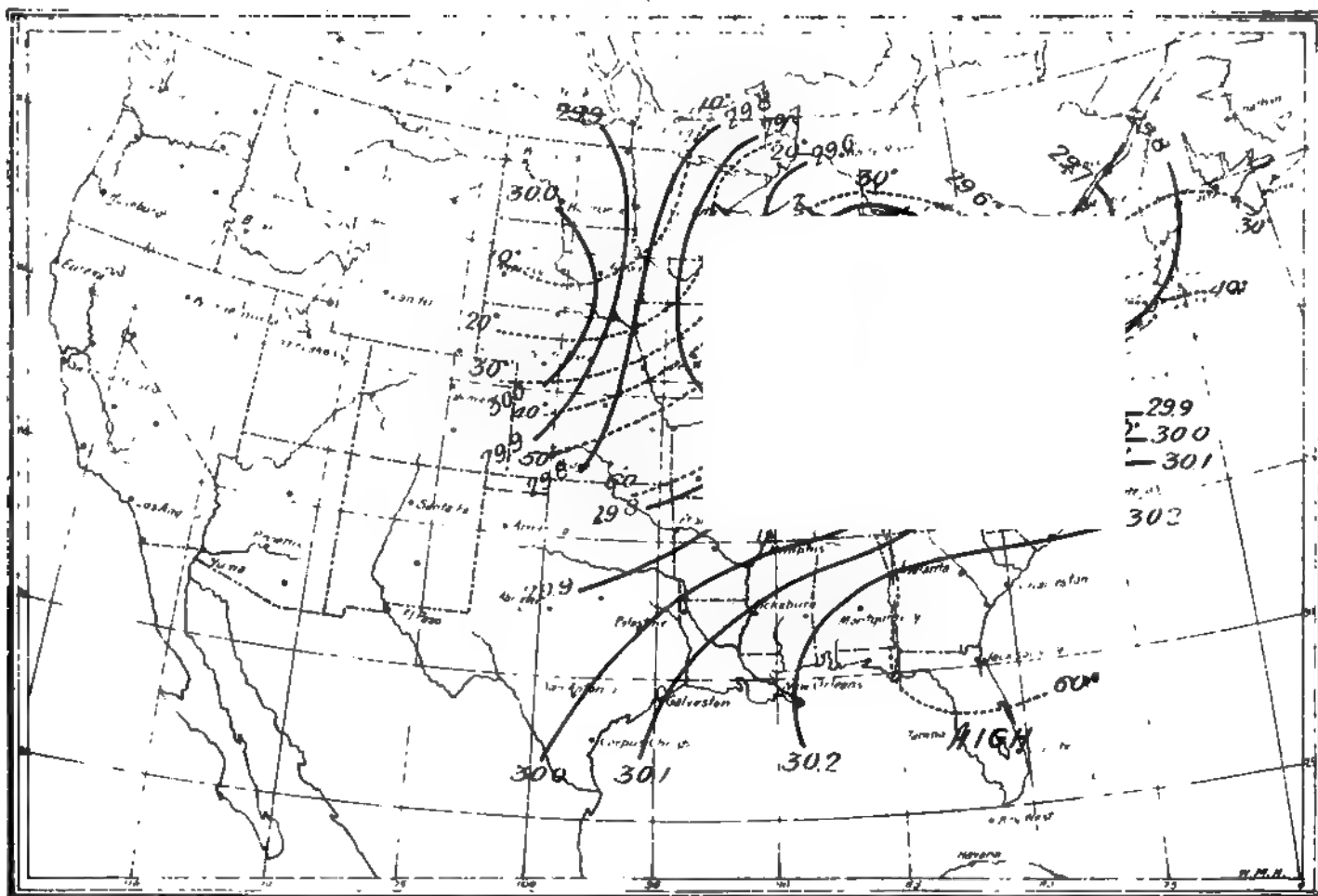


Chart III.

January 9, 1876—7:35 a. m.

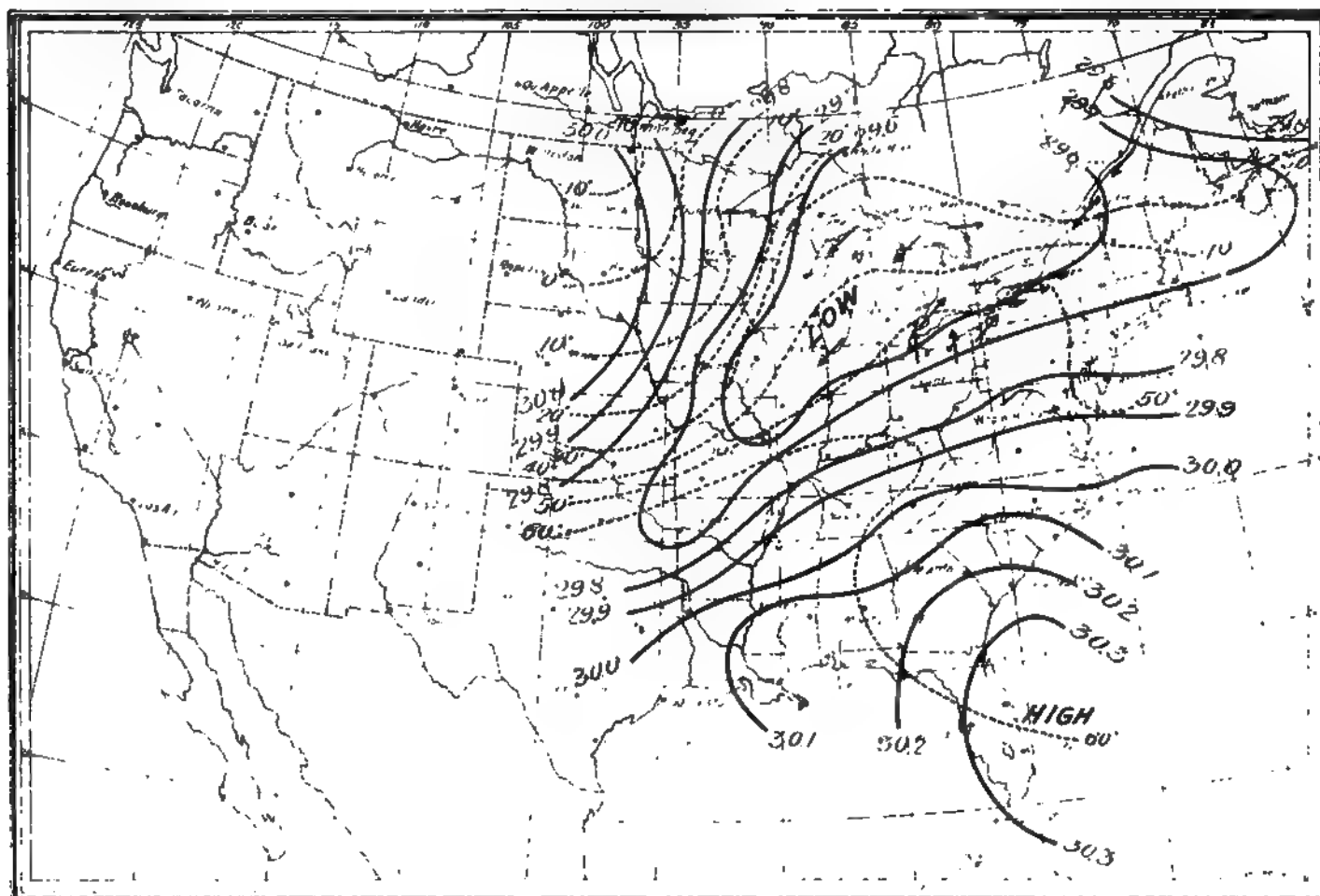
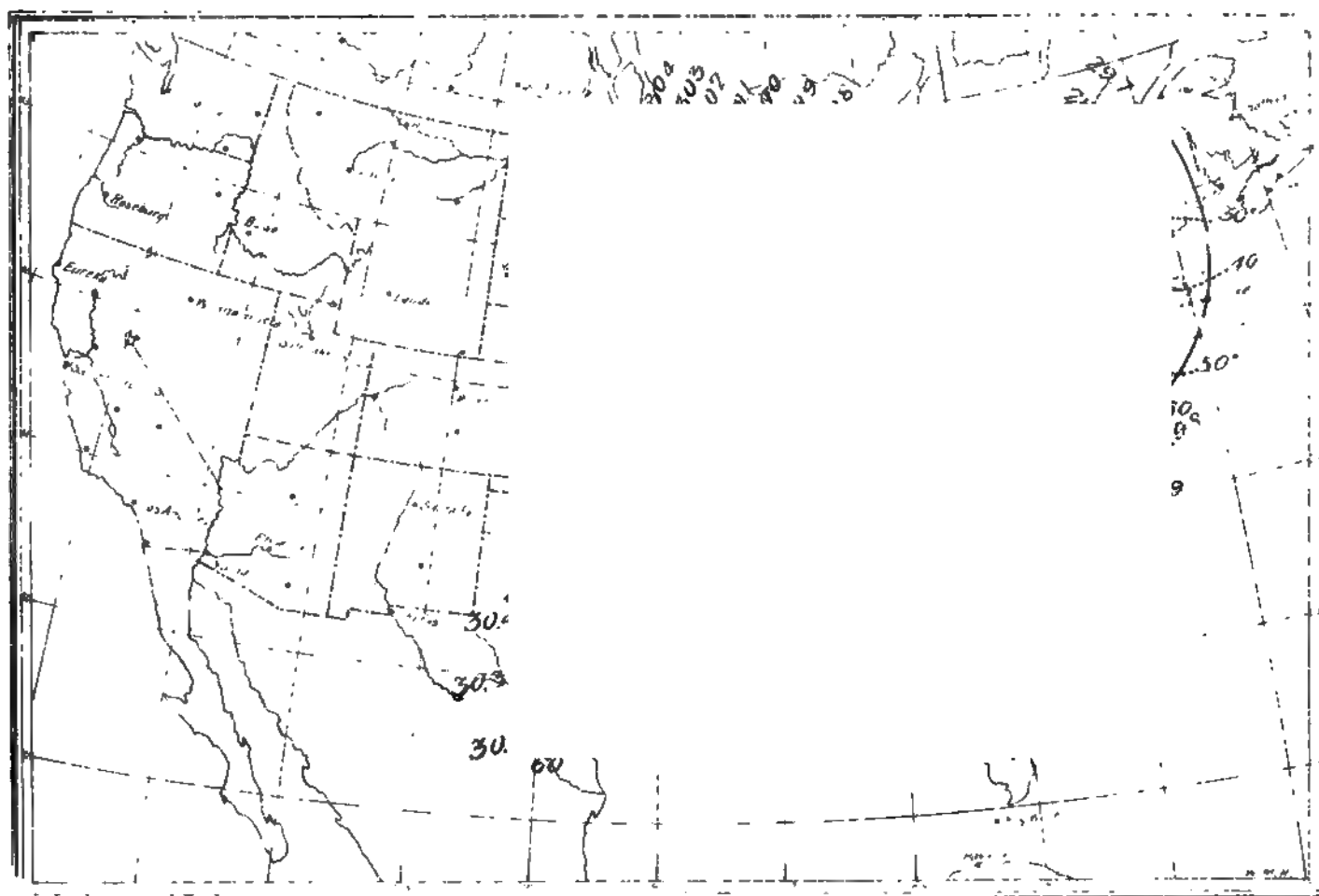


Chart IV.

January 10, 1876—1 a. m.



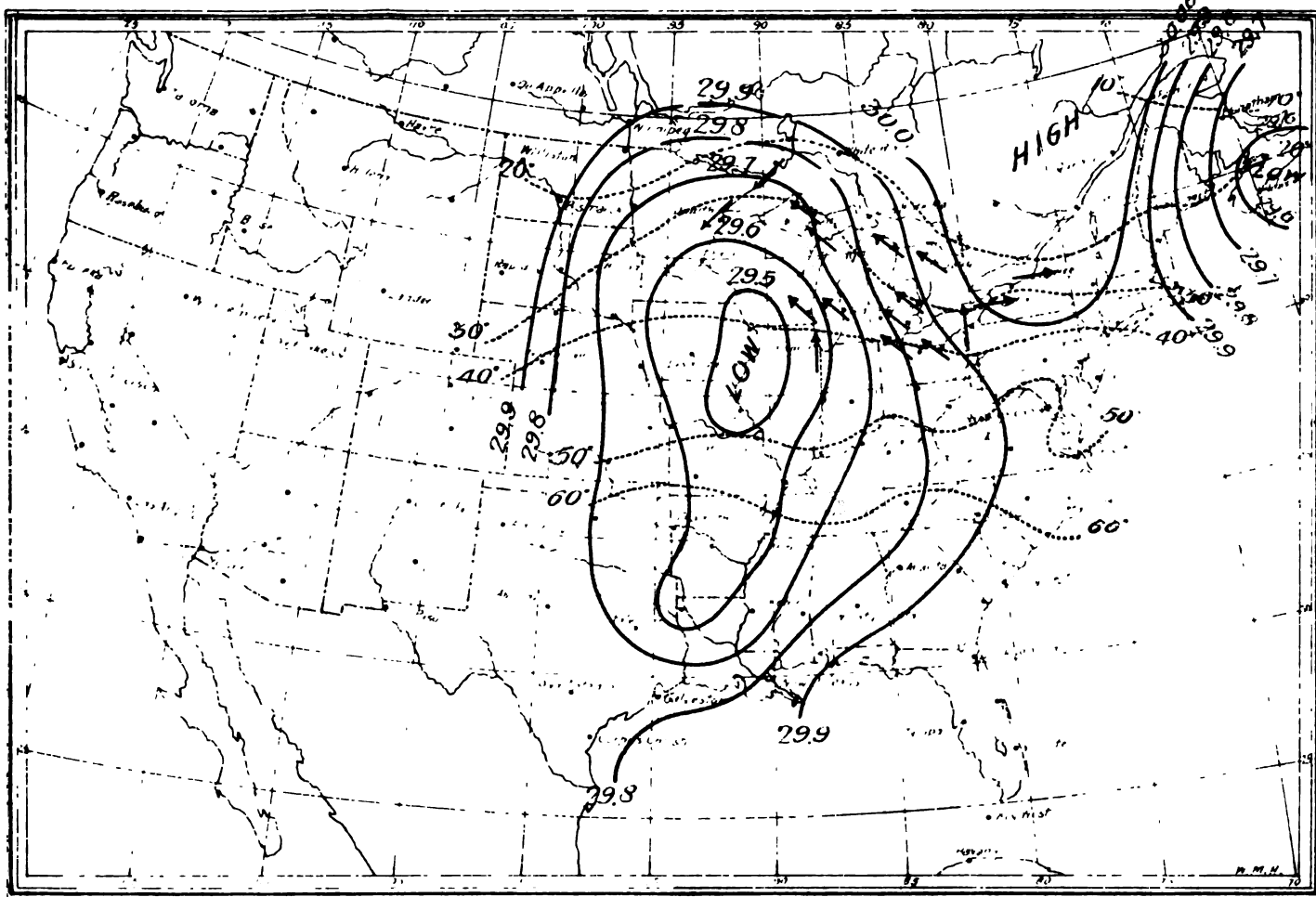


Chart VI.

January 21, 1880—11 p. m.

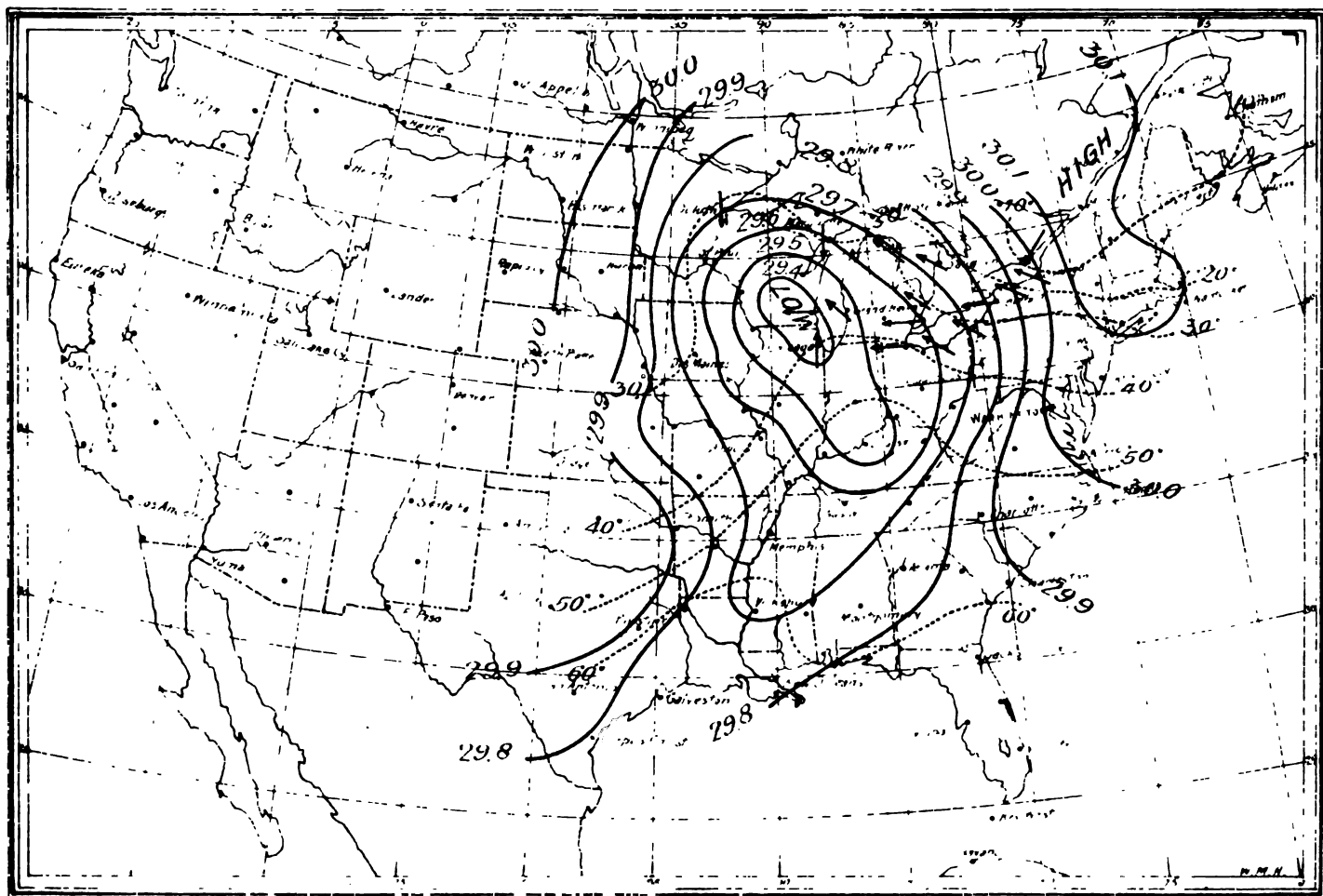


Chart VII.

January 22, 1880—7 a. m.

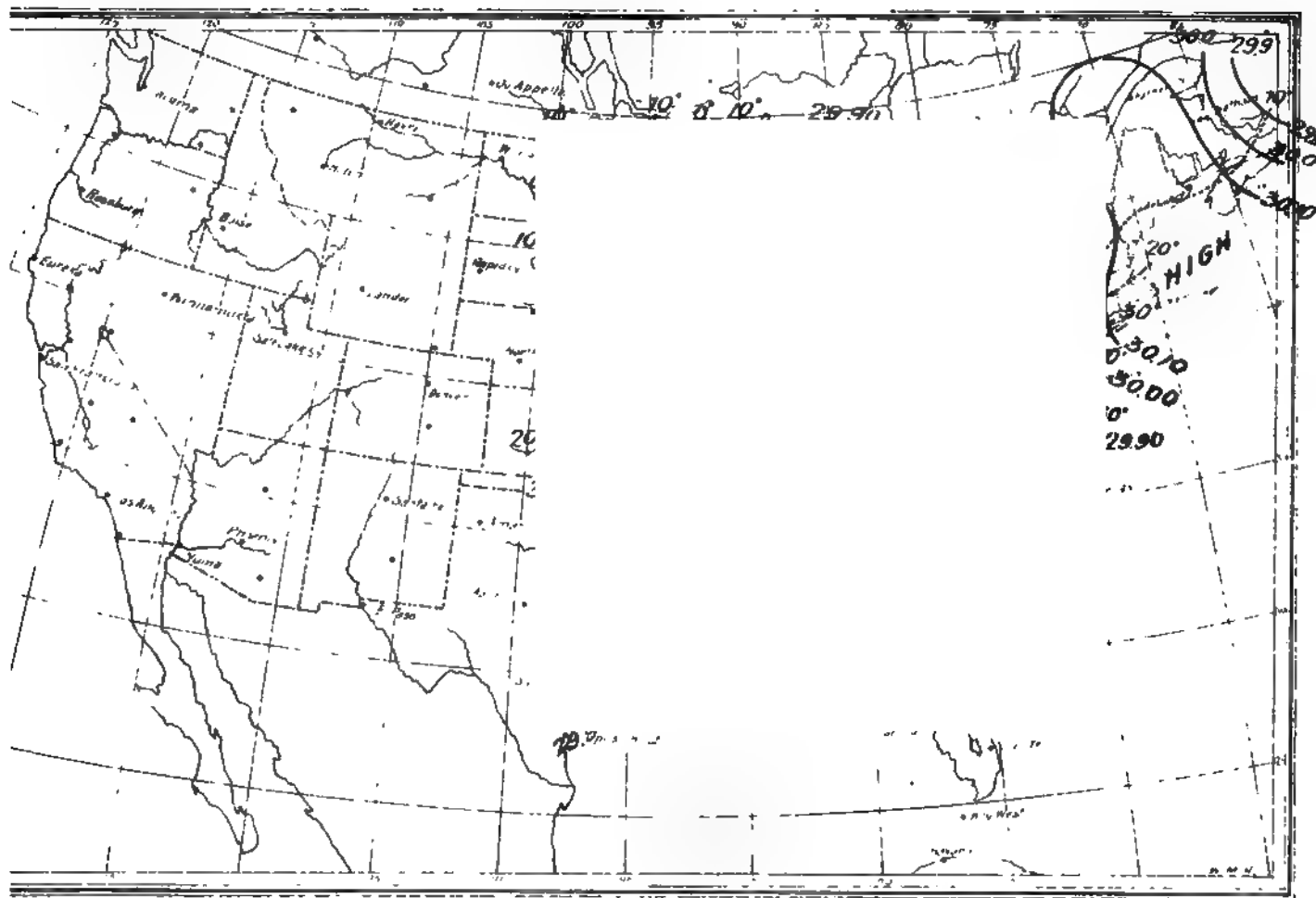
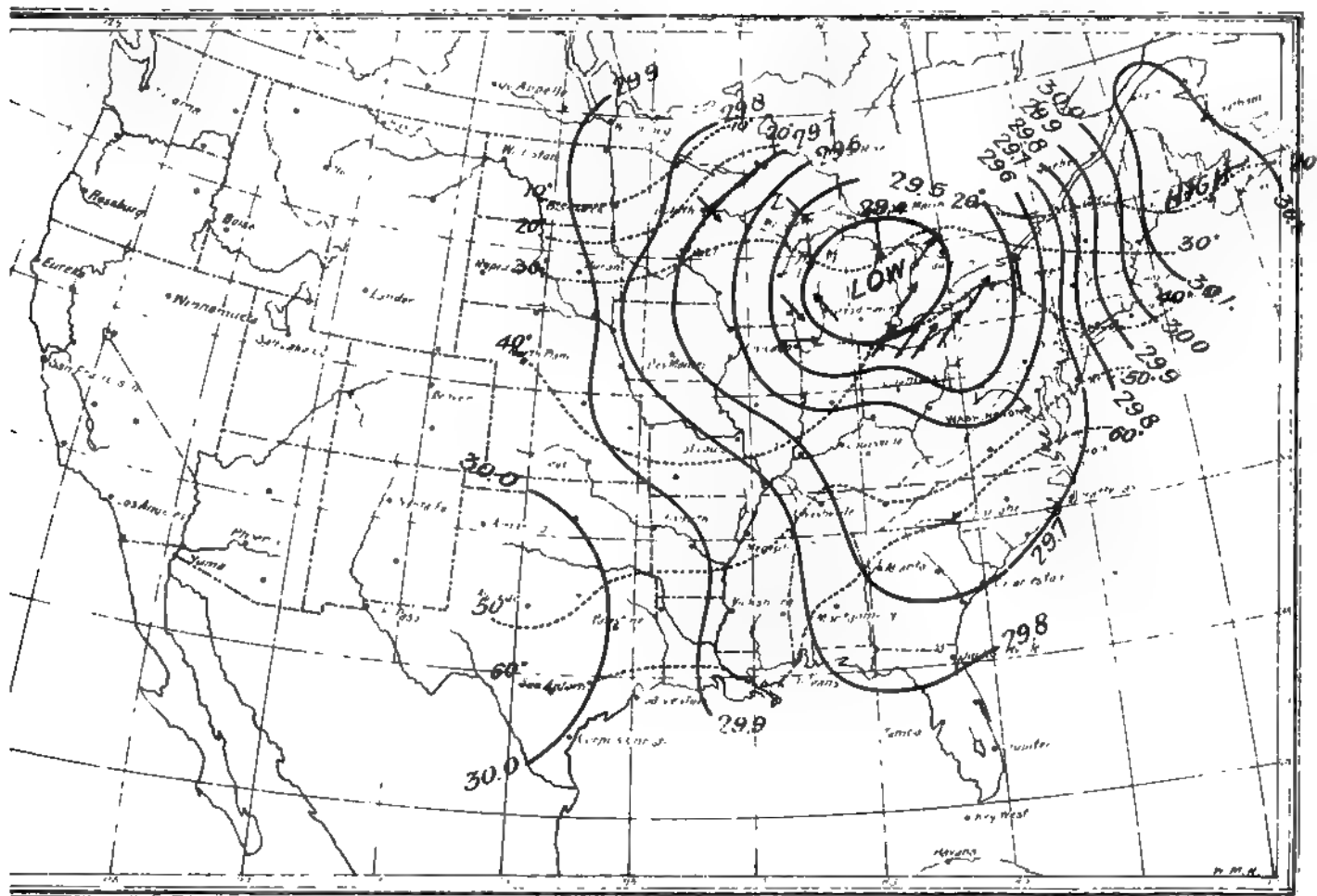


Chart VIII.

January 22, 1880—3 p. m.



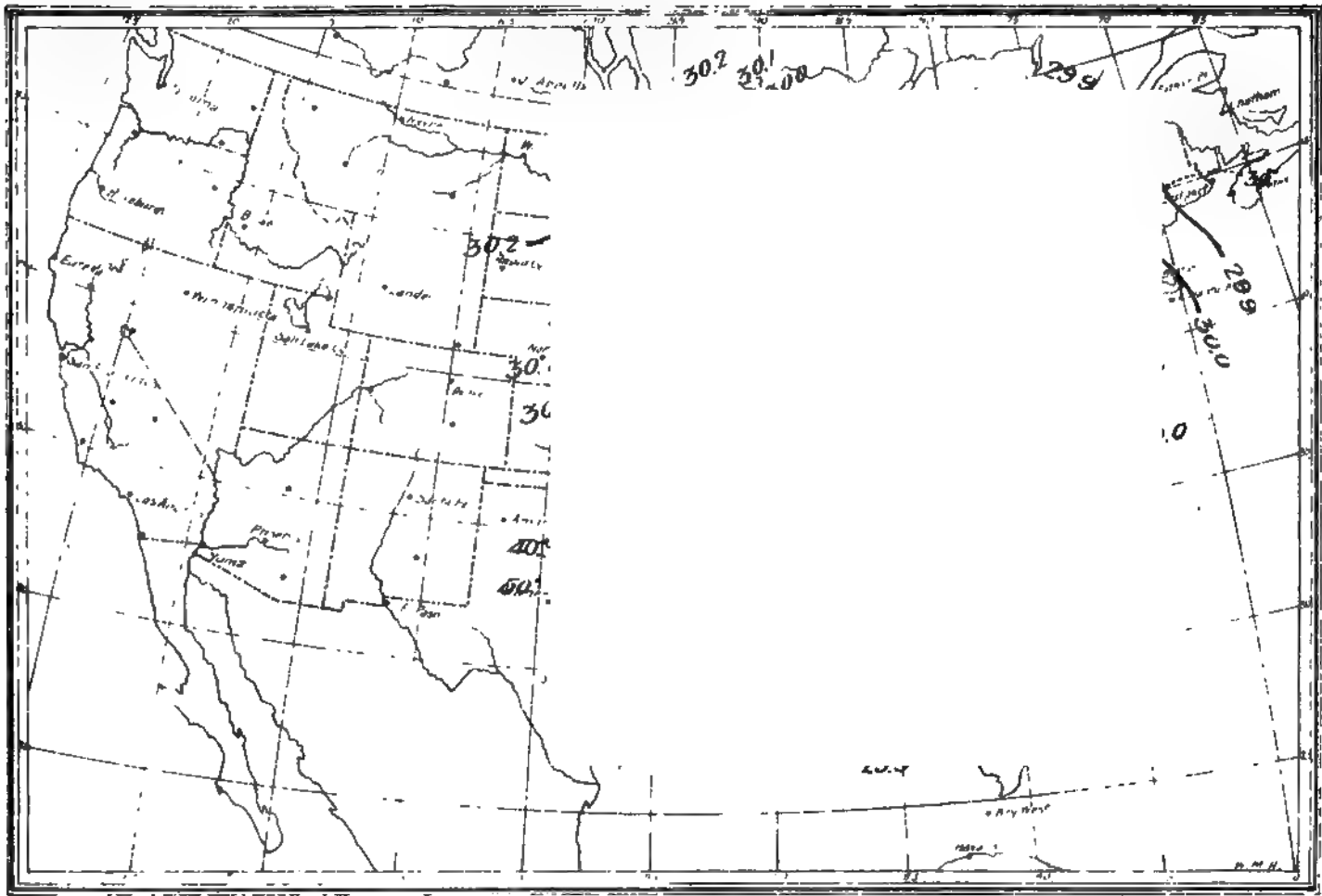


Chart X

January 20, 1881—11 p. m.

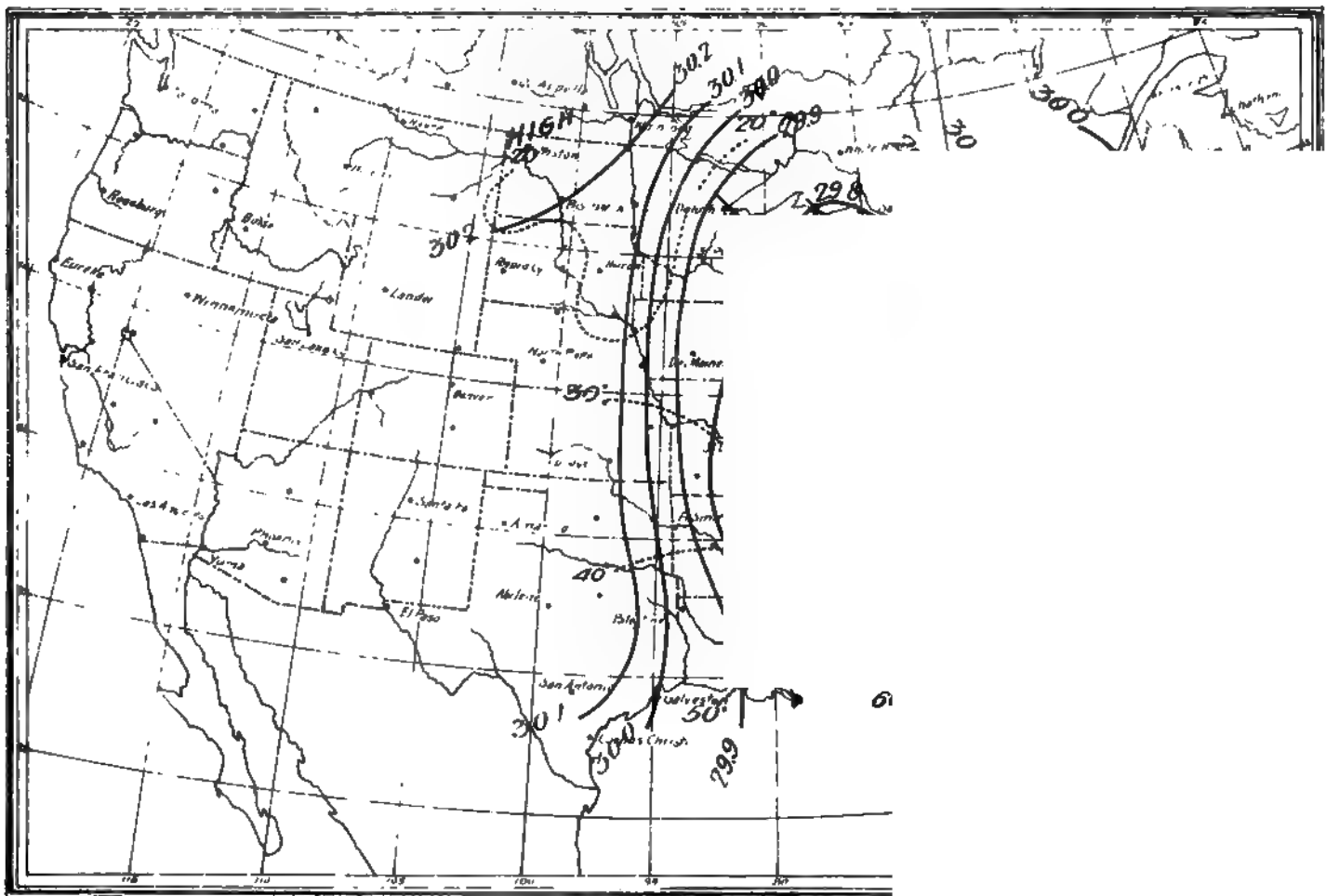


Chart XI.

January 21, 1881—7 a. m.

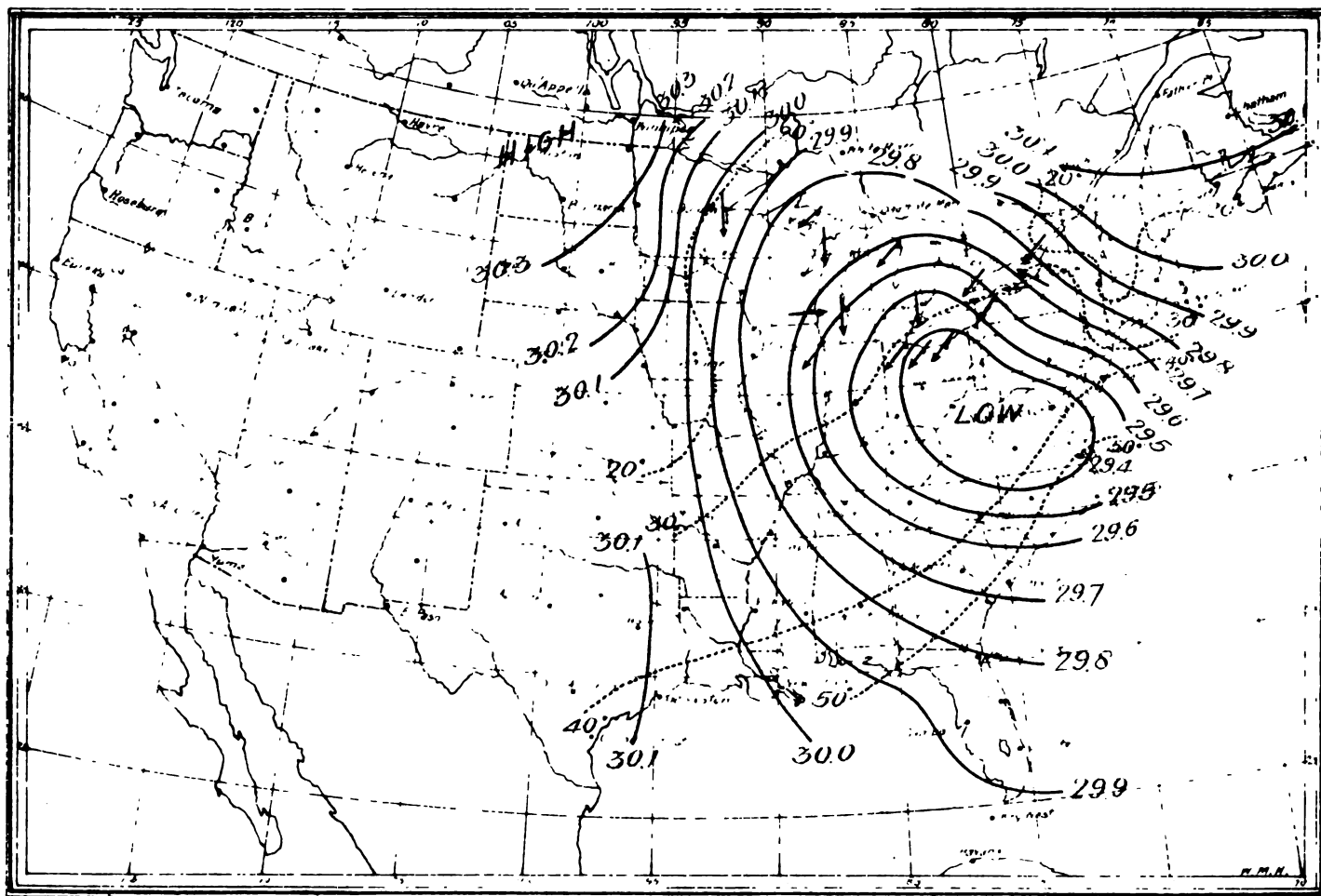


Chart XII.

January 21, 1881—3 p. m.

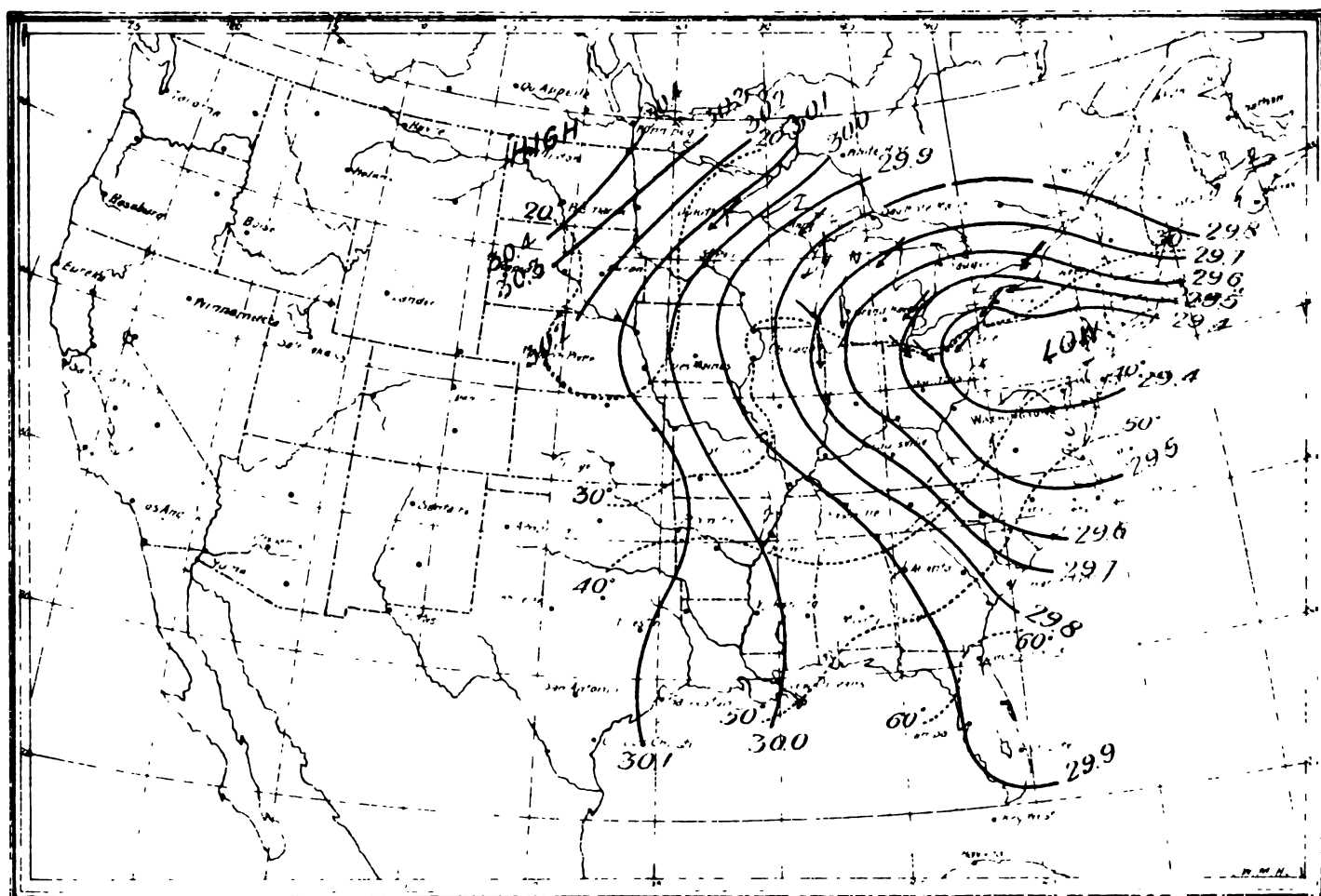


Chart XIII.

January 25, 1882—11 p. m.

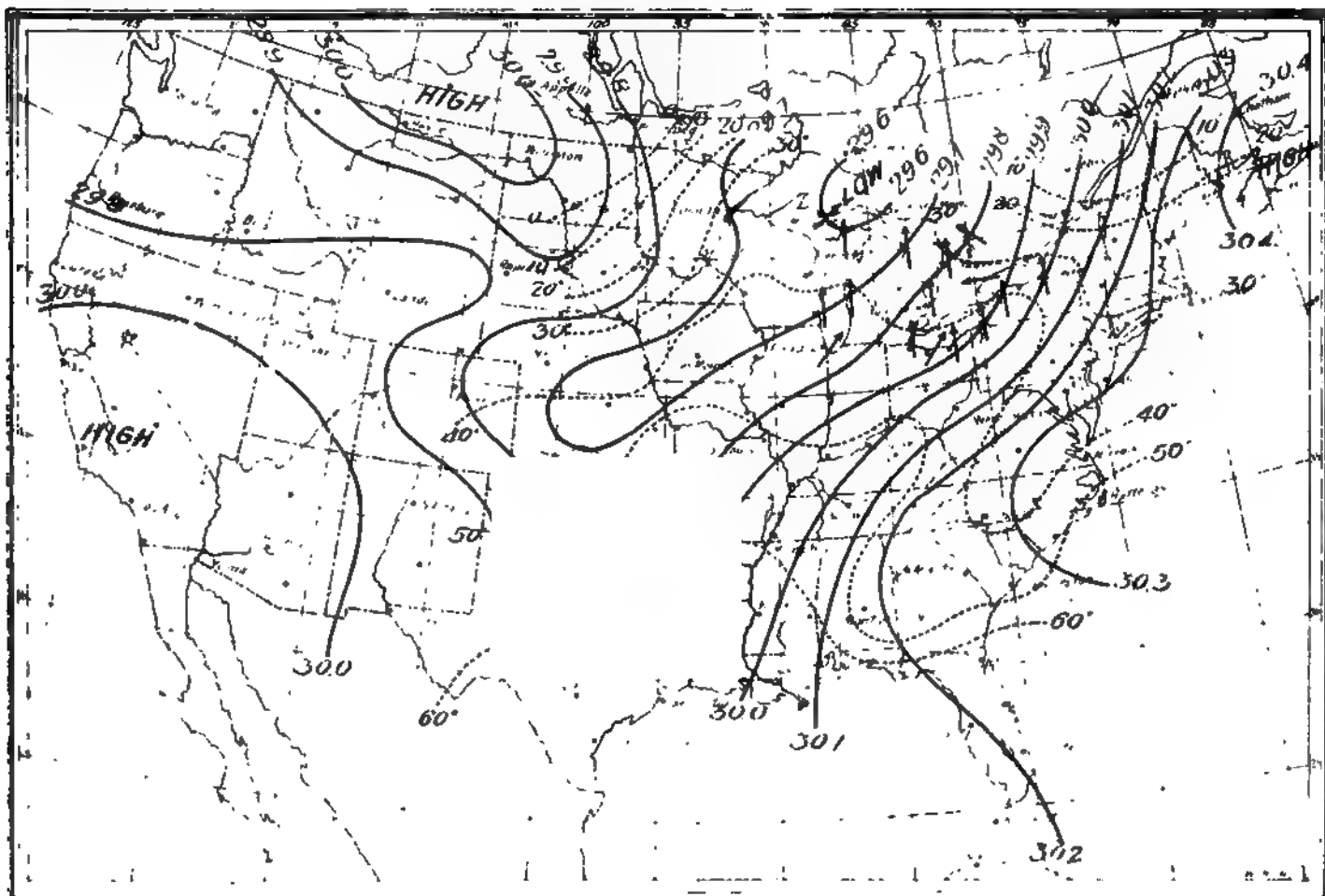


Chart XIV.

January 26, 1882—7 a. m.

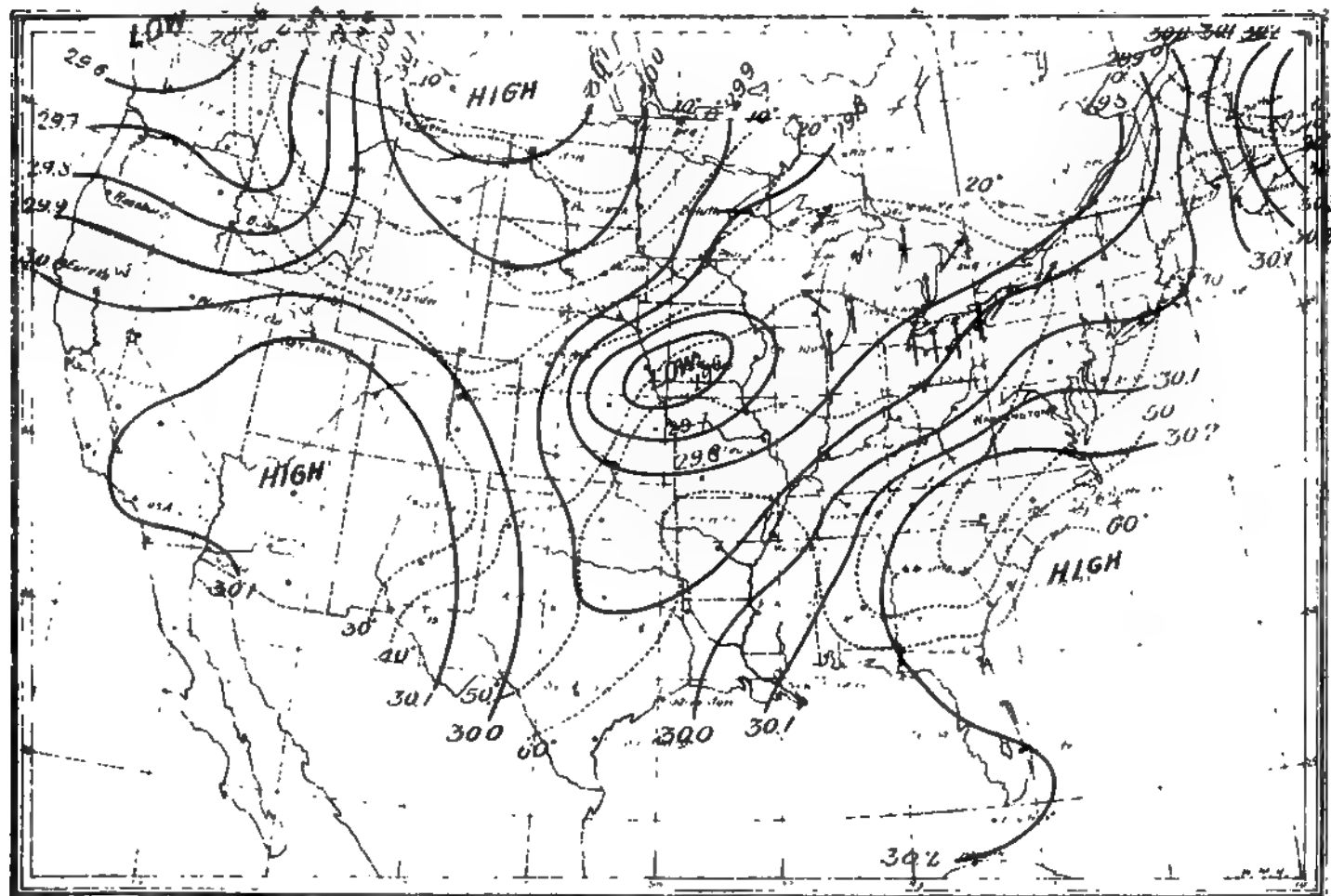


Chart XV.

January 26, 1882—3 p. m.

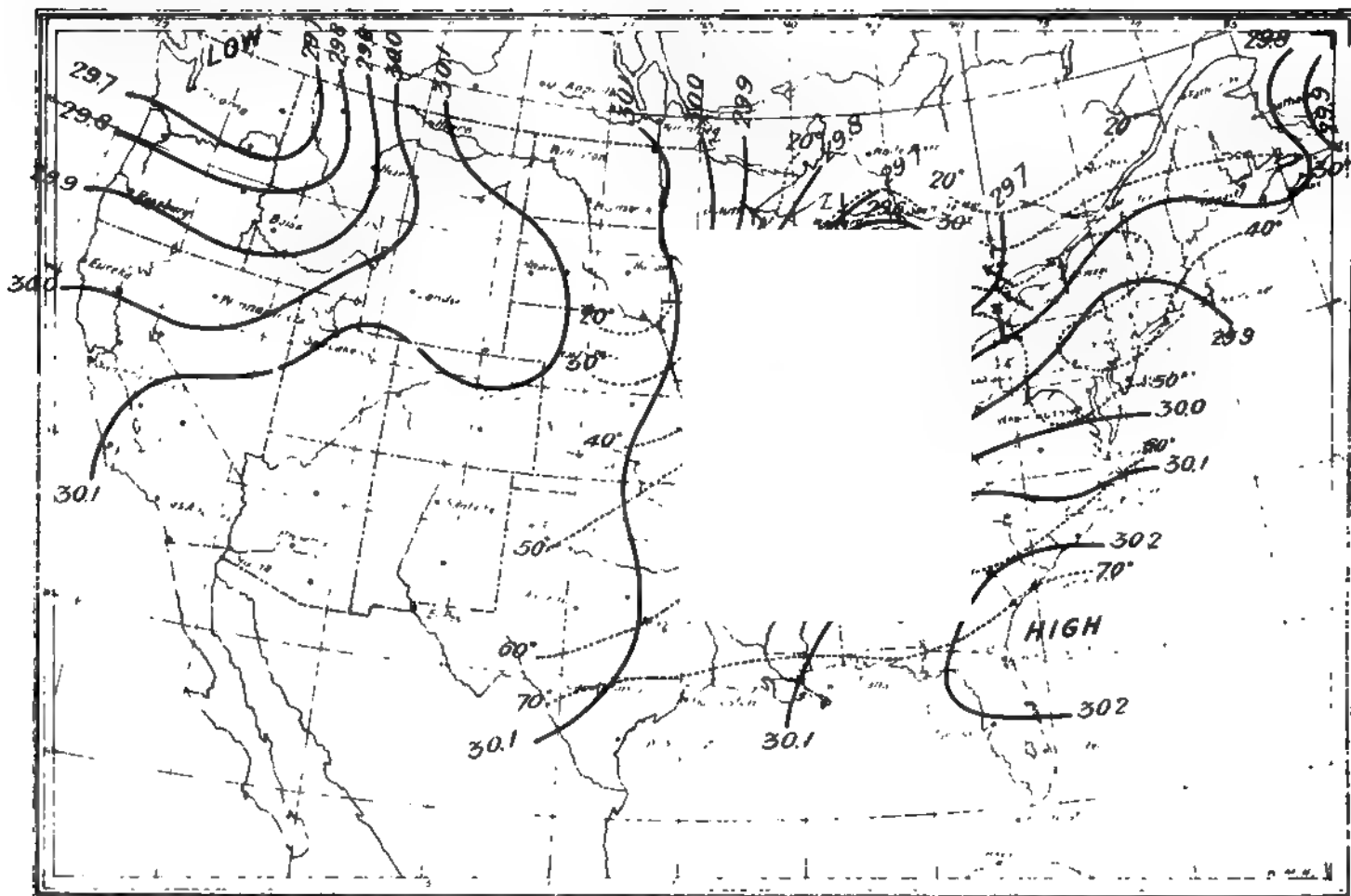


Chart XVI.

January 26, 1882—11 p. m.

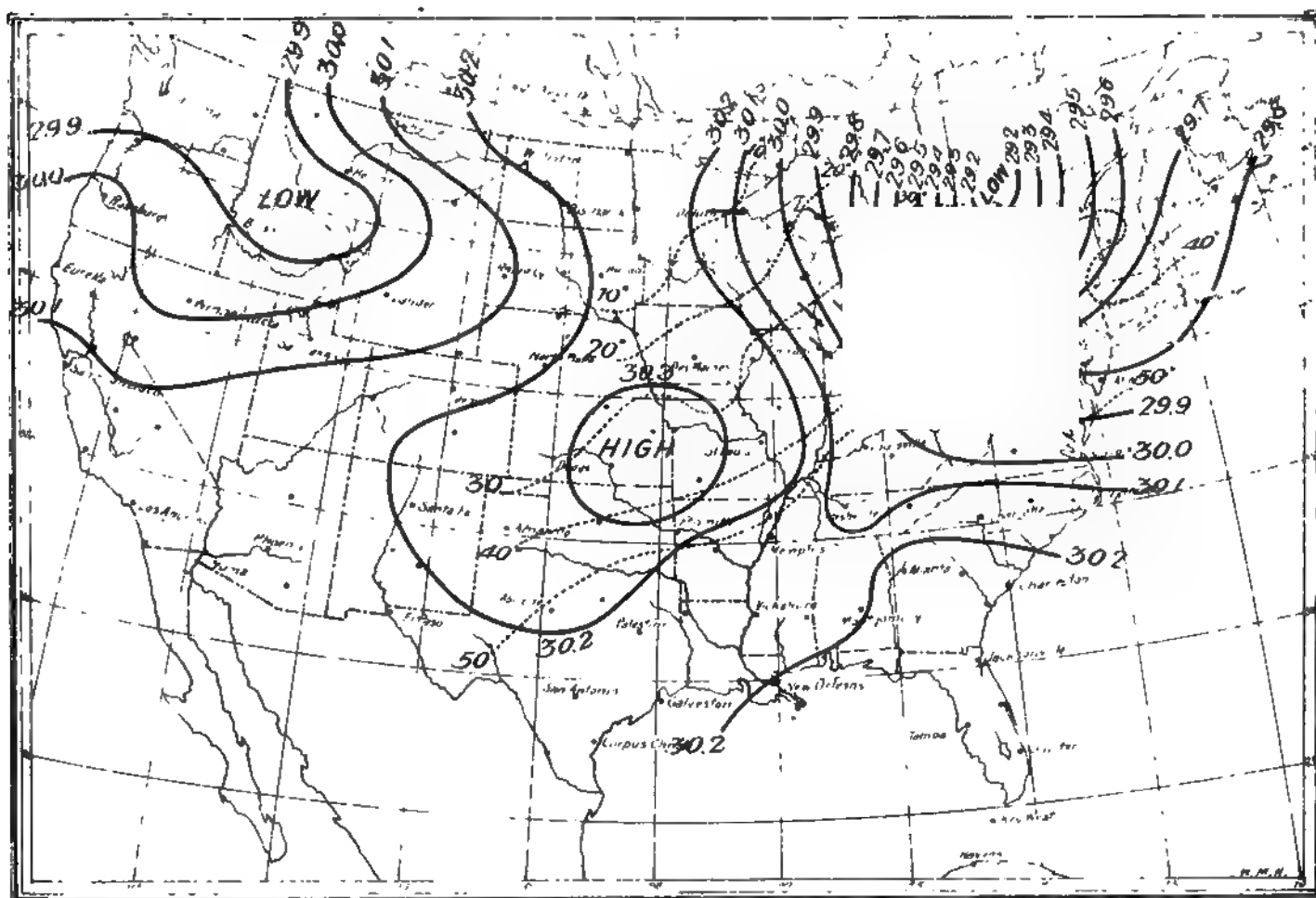


Chart XVII.

January 19, 1888—11 p. m.

Chart XVIII.

January 20, 1888—7 a. m.

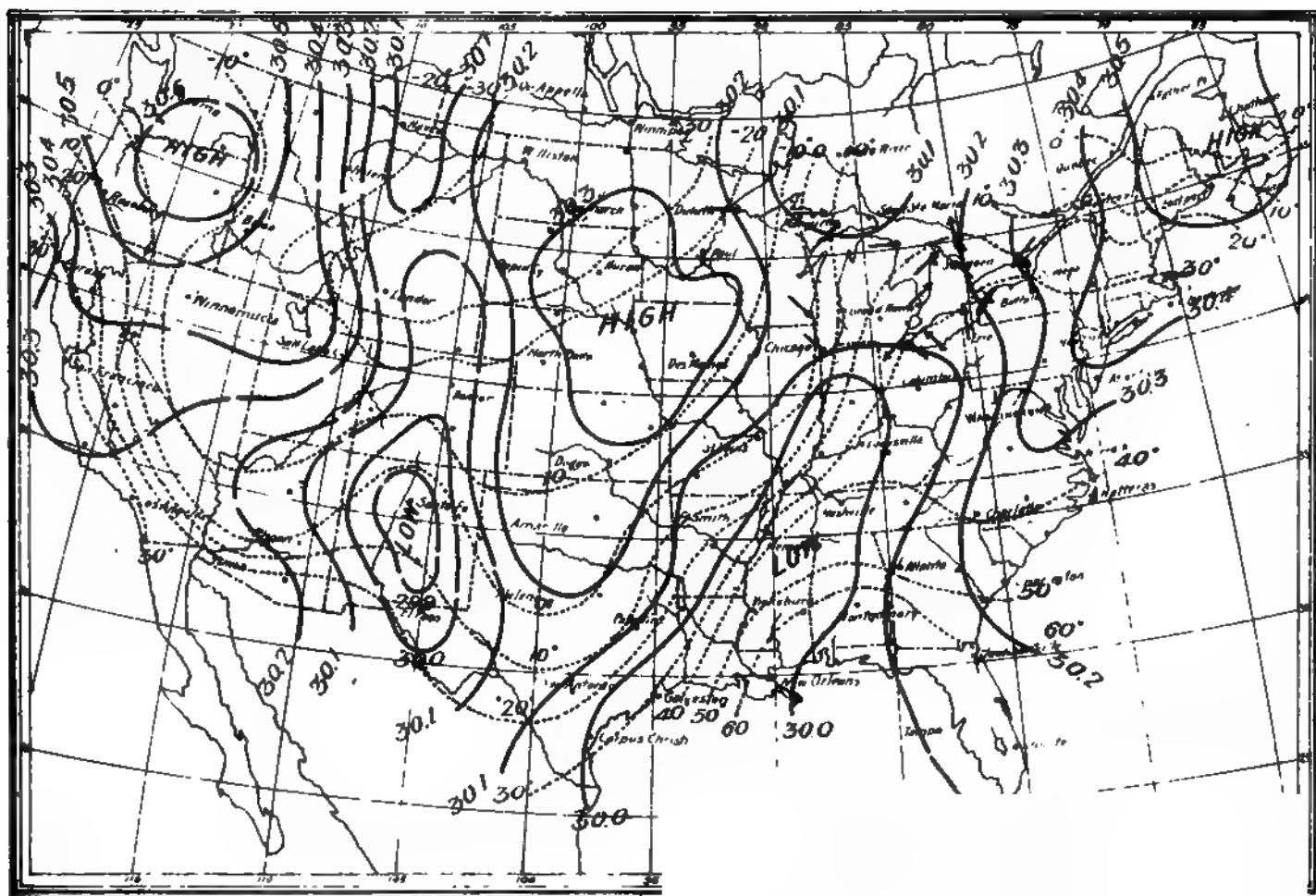


Chart XIX.

January 20, 1883—8 p. m.

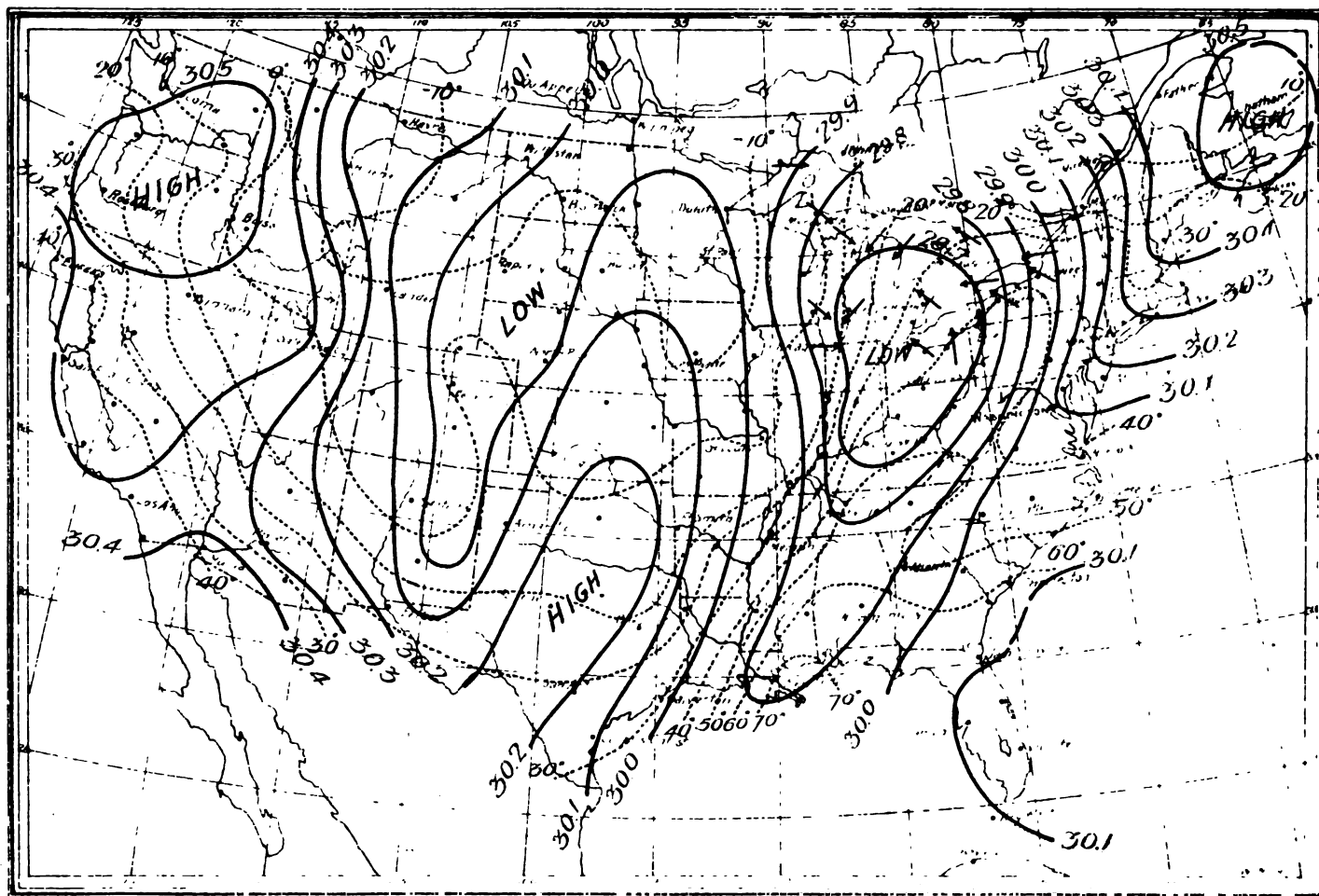


Chart XX.

January 20, 1883—11 p. m.

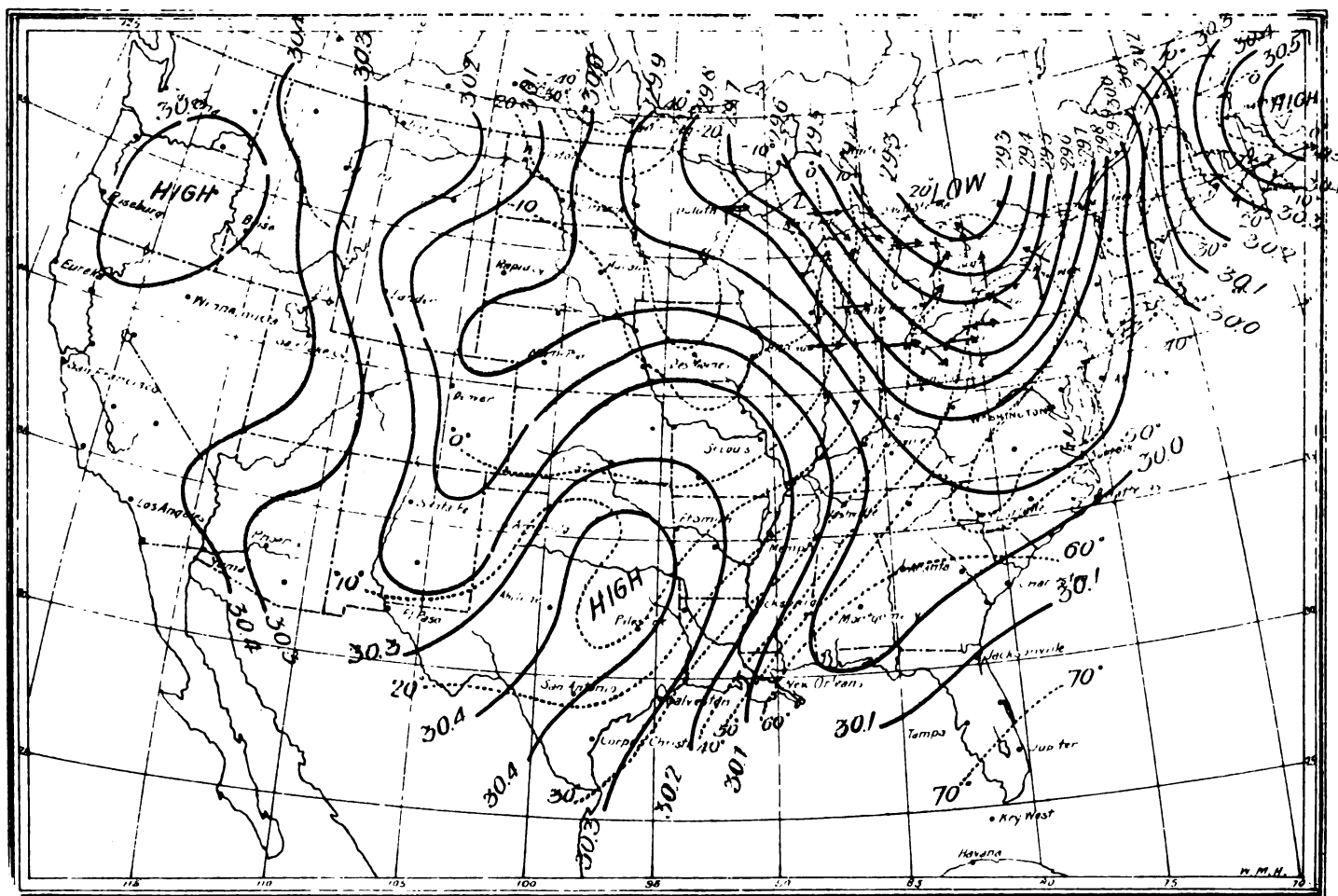


Chart XXI

January 1, 1884—7 a. m.

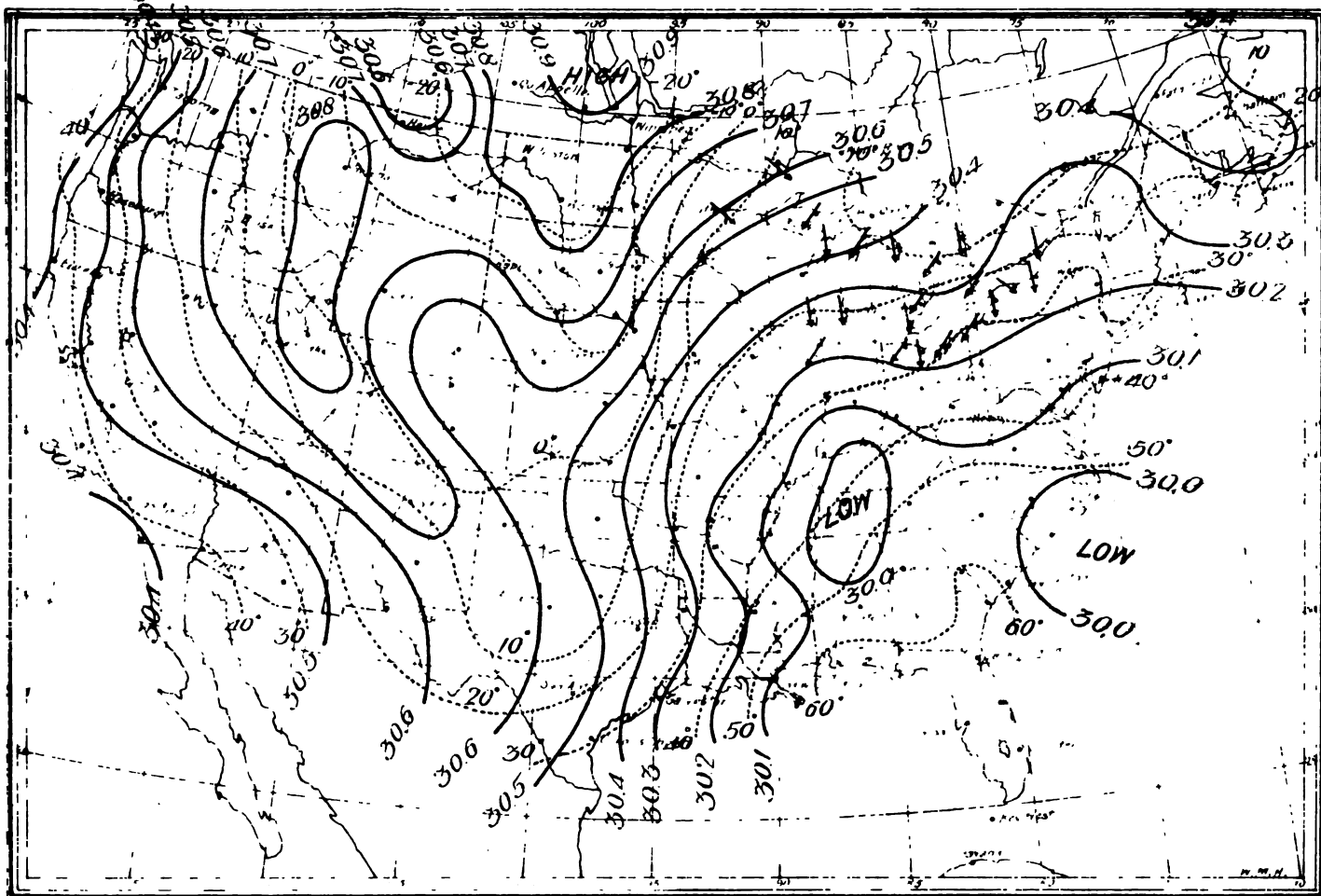
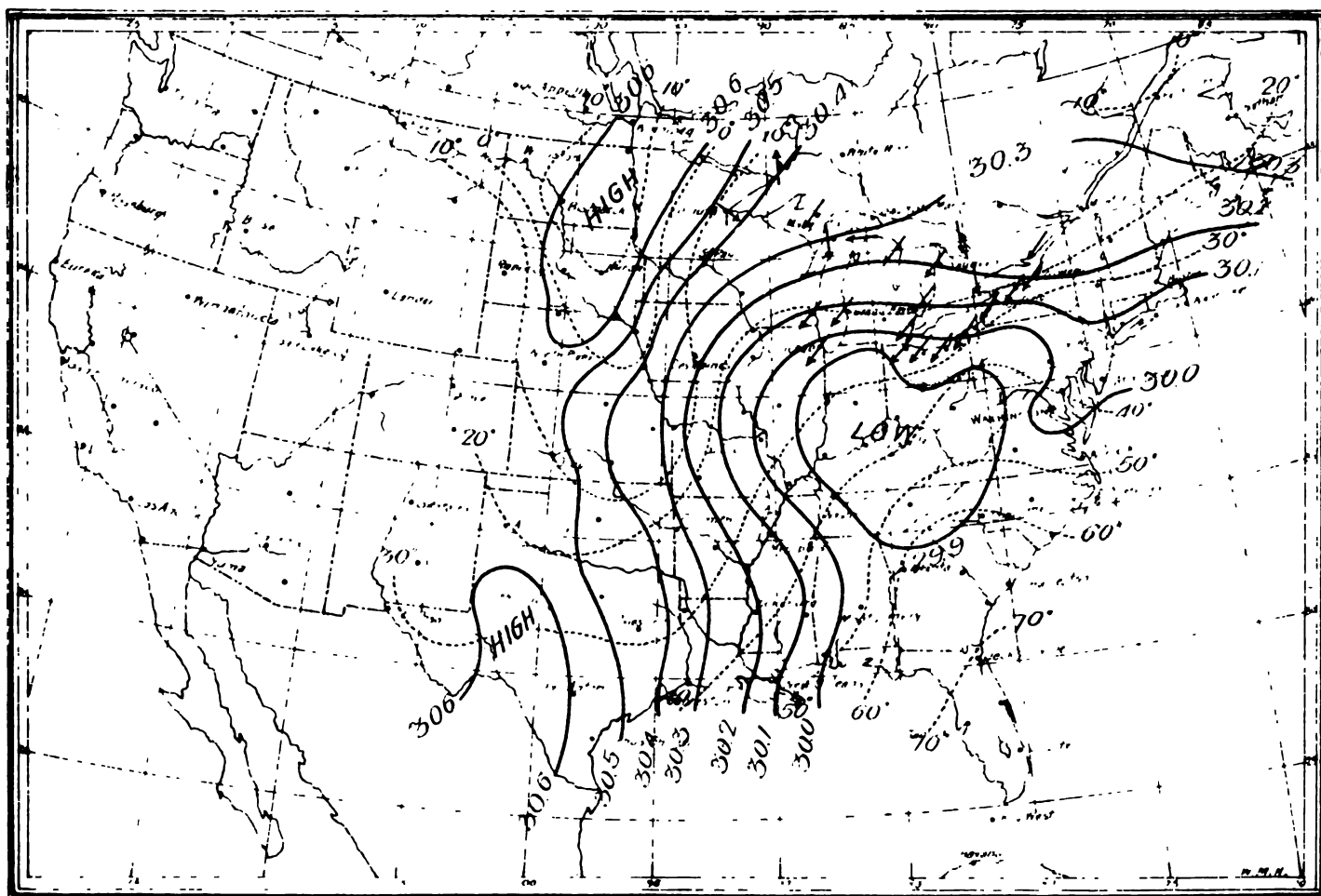


Chart XXII

January 1, 1884—3 p. m.



[illegible]

Chart XXV.

January 5, 1885—3 p. m.

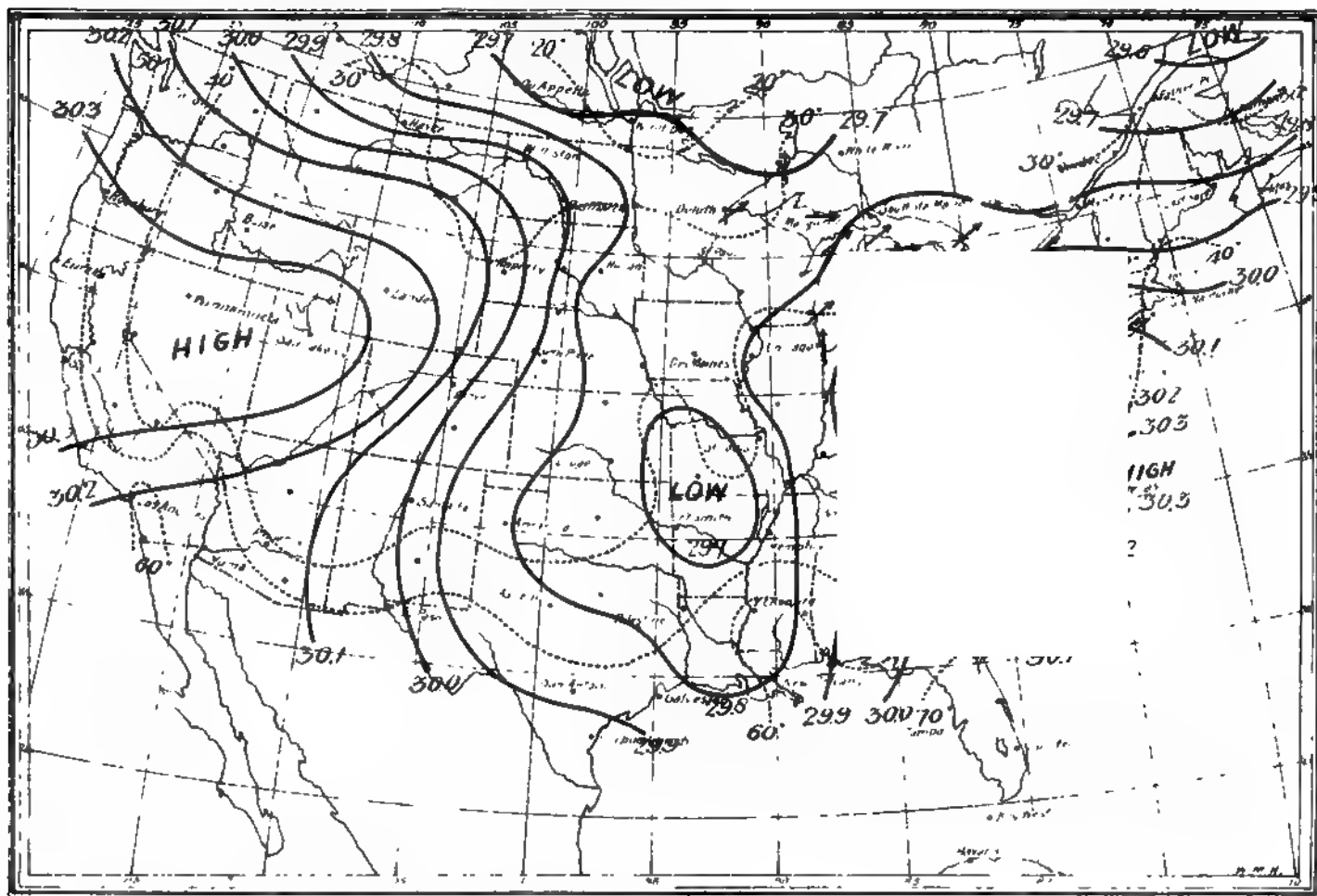


Chart XXVI.

January 6, 1885—11 p. m.

Chart XXVII

January 6, 1885—7 a. m.

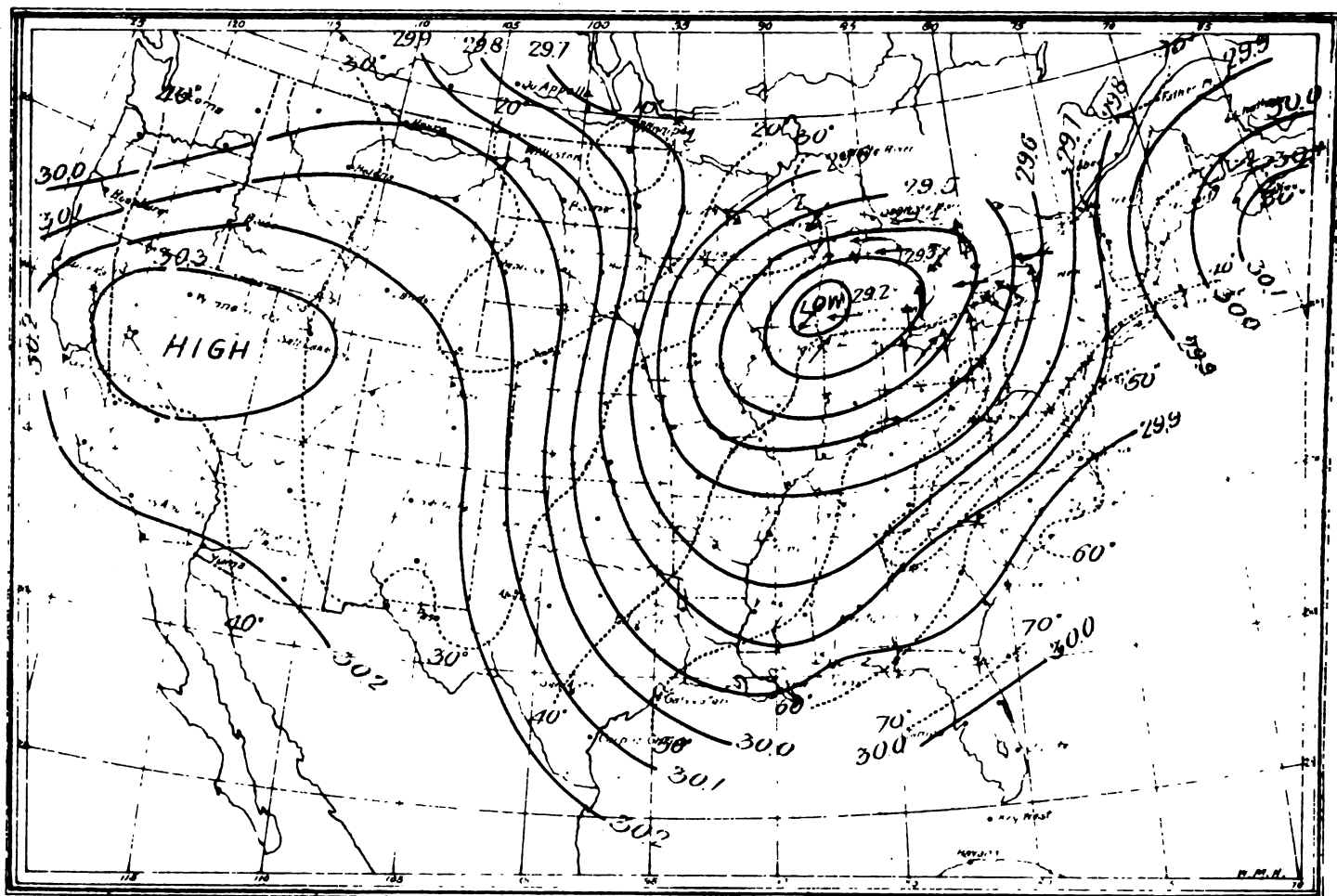


Chart XXVIII.

January 6, 1885—3 p. m.

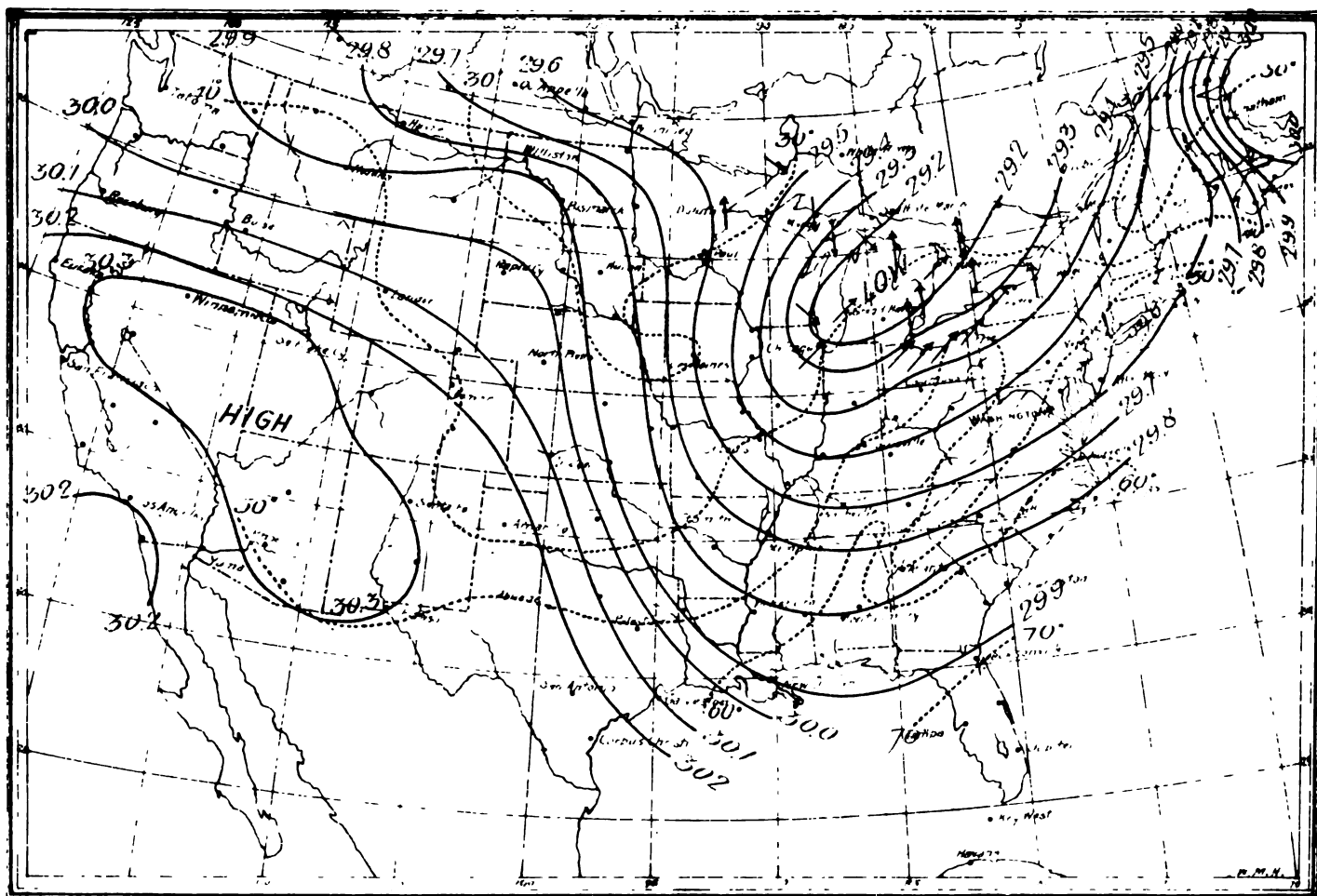


Chart XXIX

January 10, 1885—11 p. m.

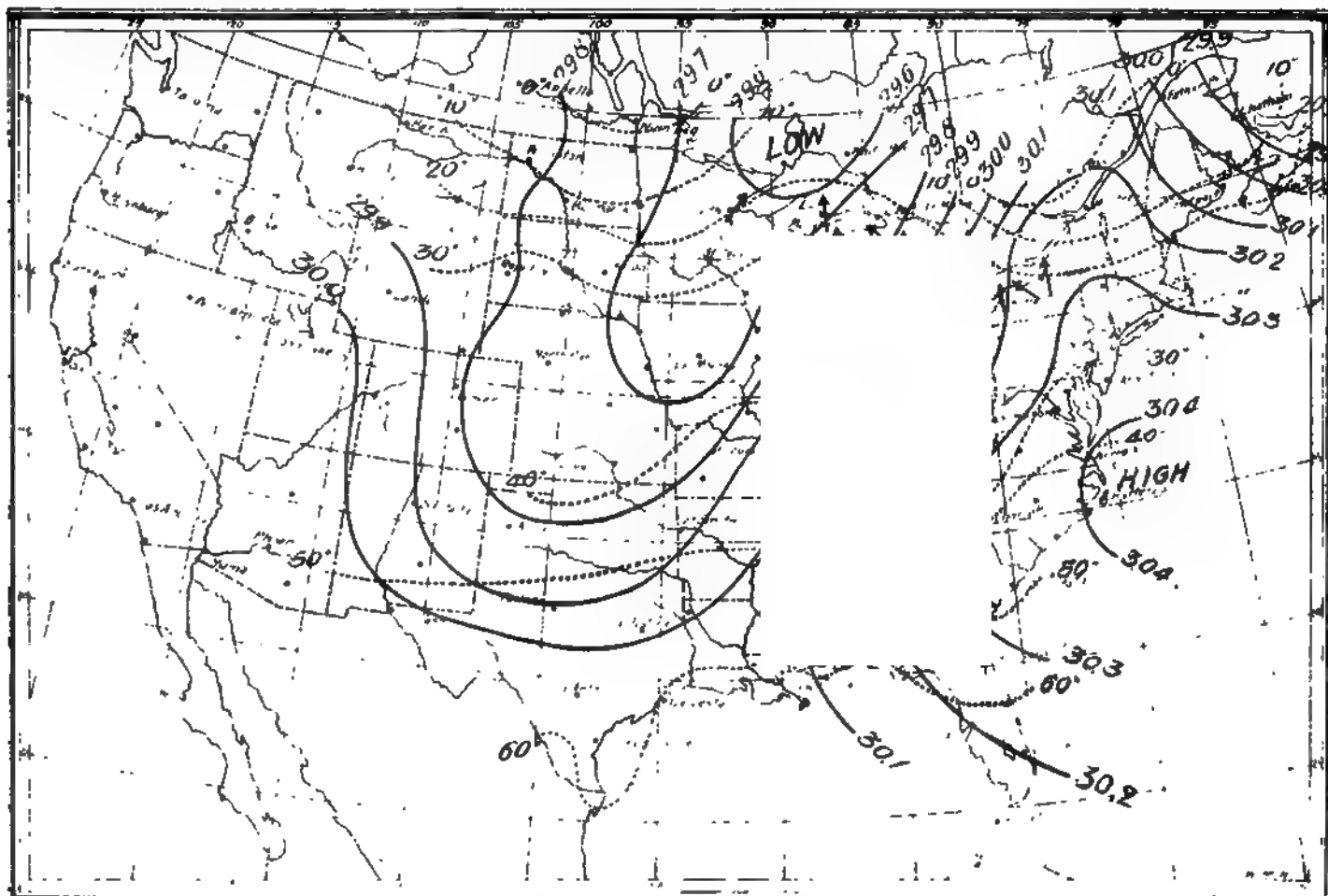
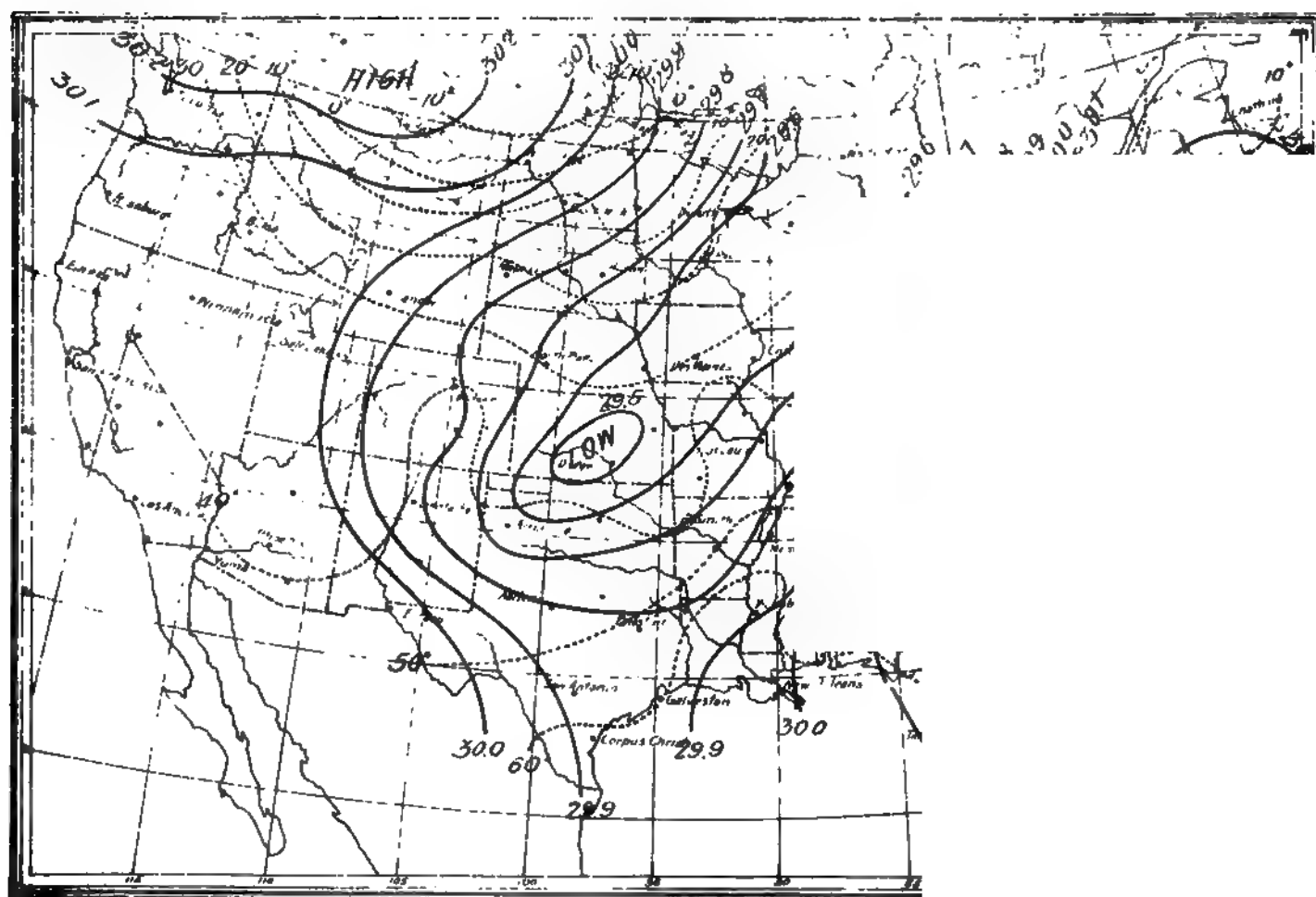


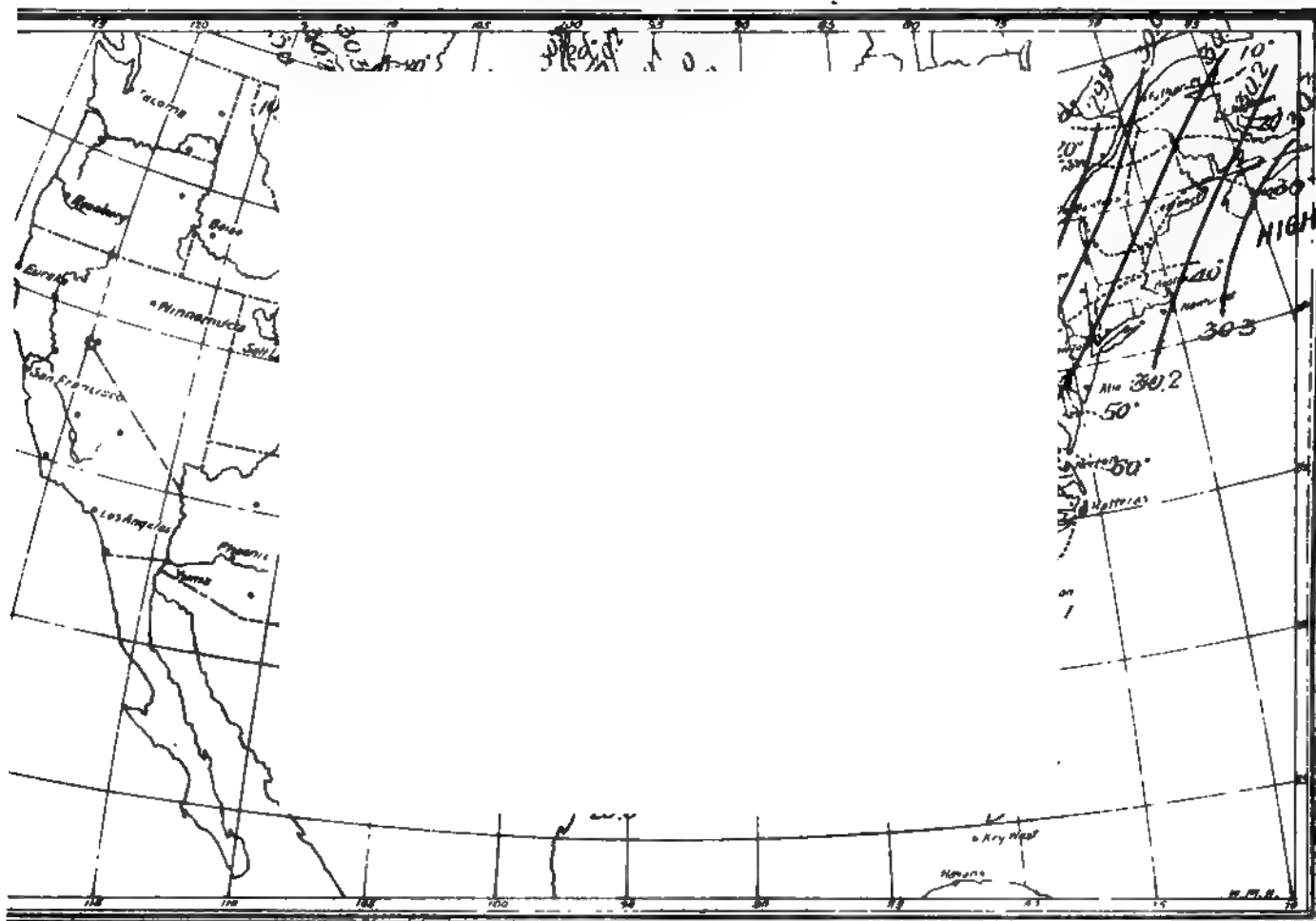
Chart XXX

January 11, 1885—7 a. m.



art XXXI.

January 11, 1885—3 p. m.



art XXXII.

January 11, 1885—11 p. m.



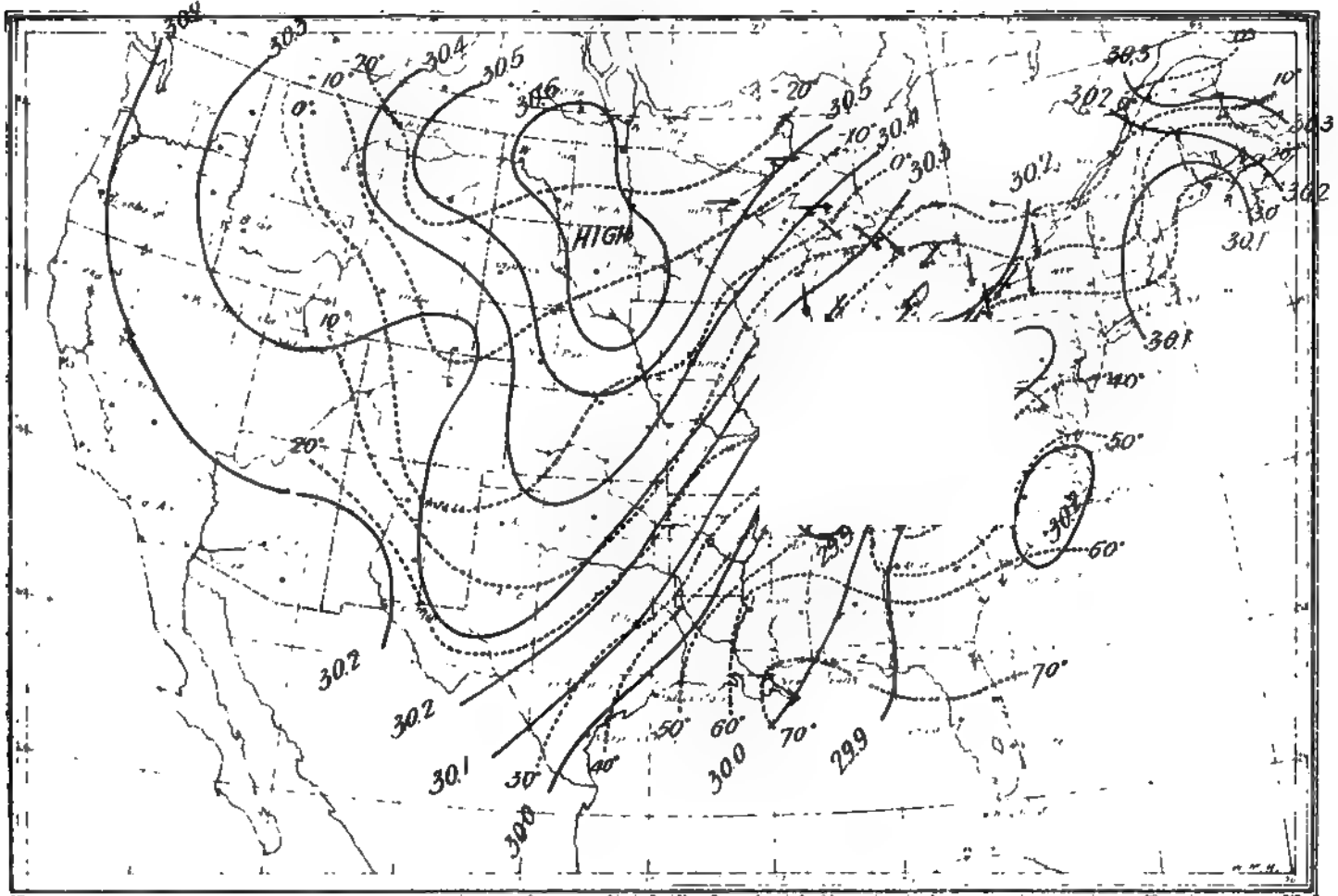


Chart XXXIV.

January 16, 1885—7 a. m.

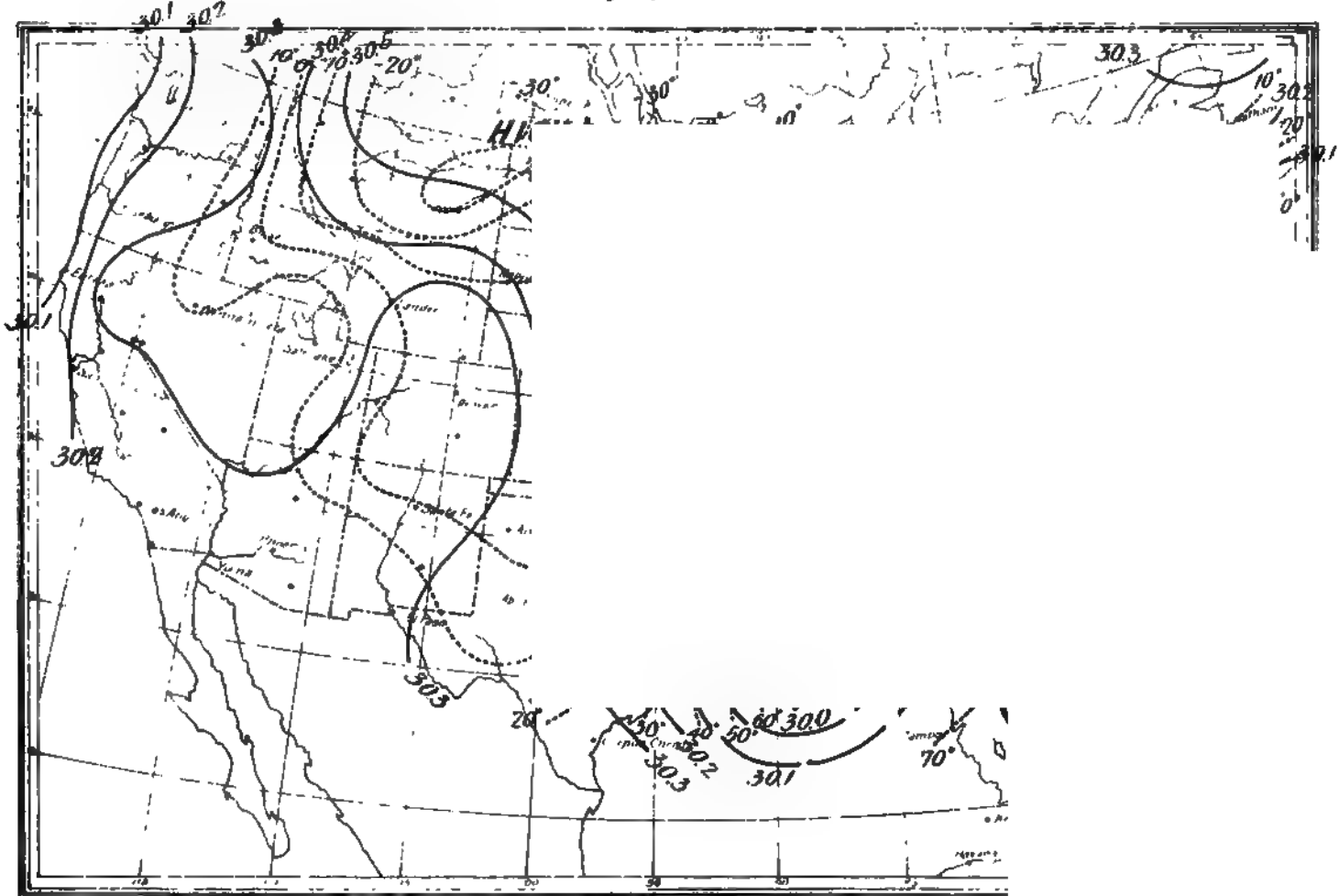


Chart XXXV.

January 16, 1885—3 p. m.

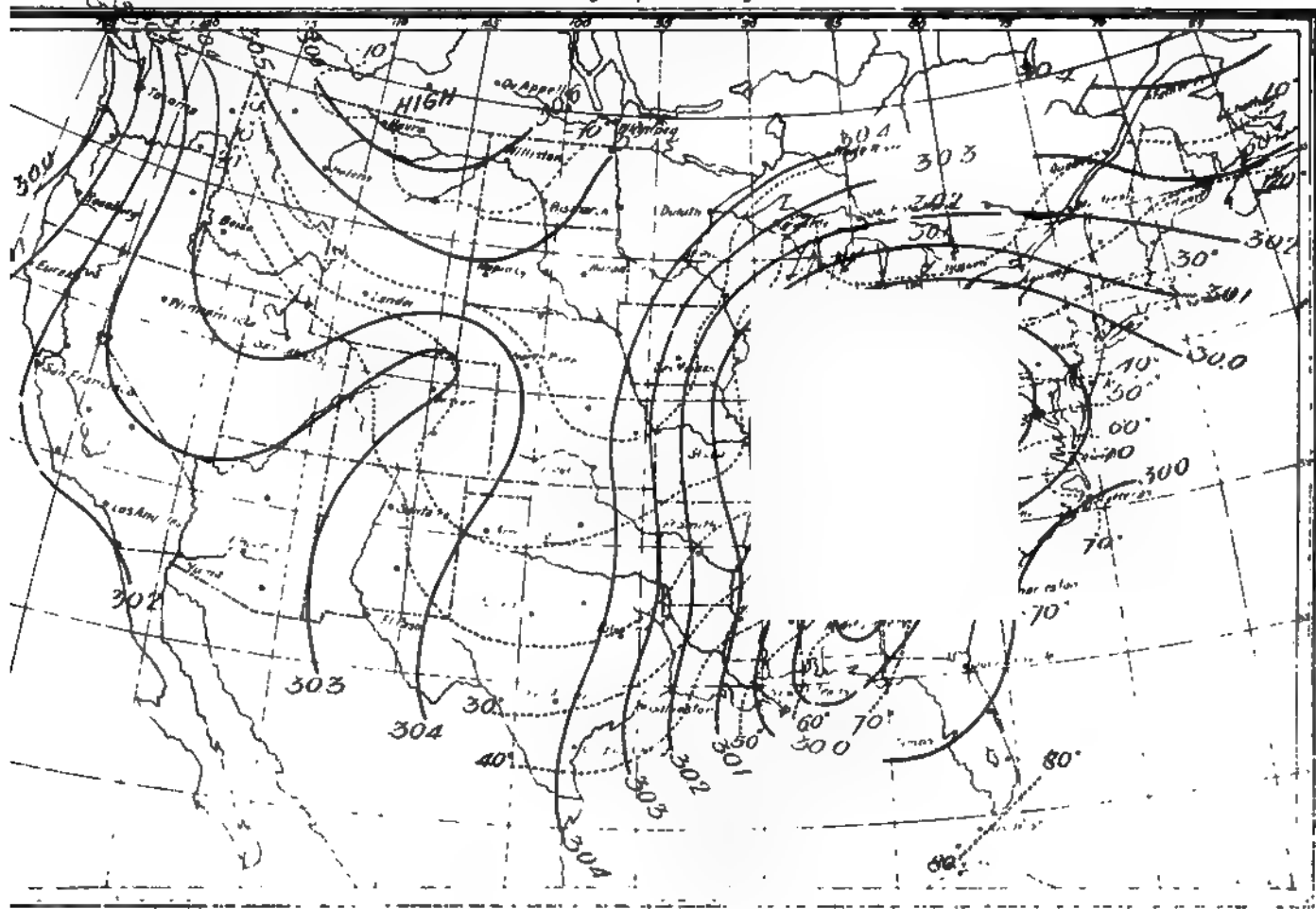


Chart XXXVI.

January 16, 1885—11 p. m.

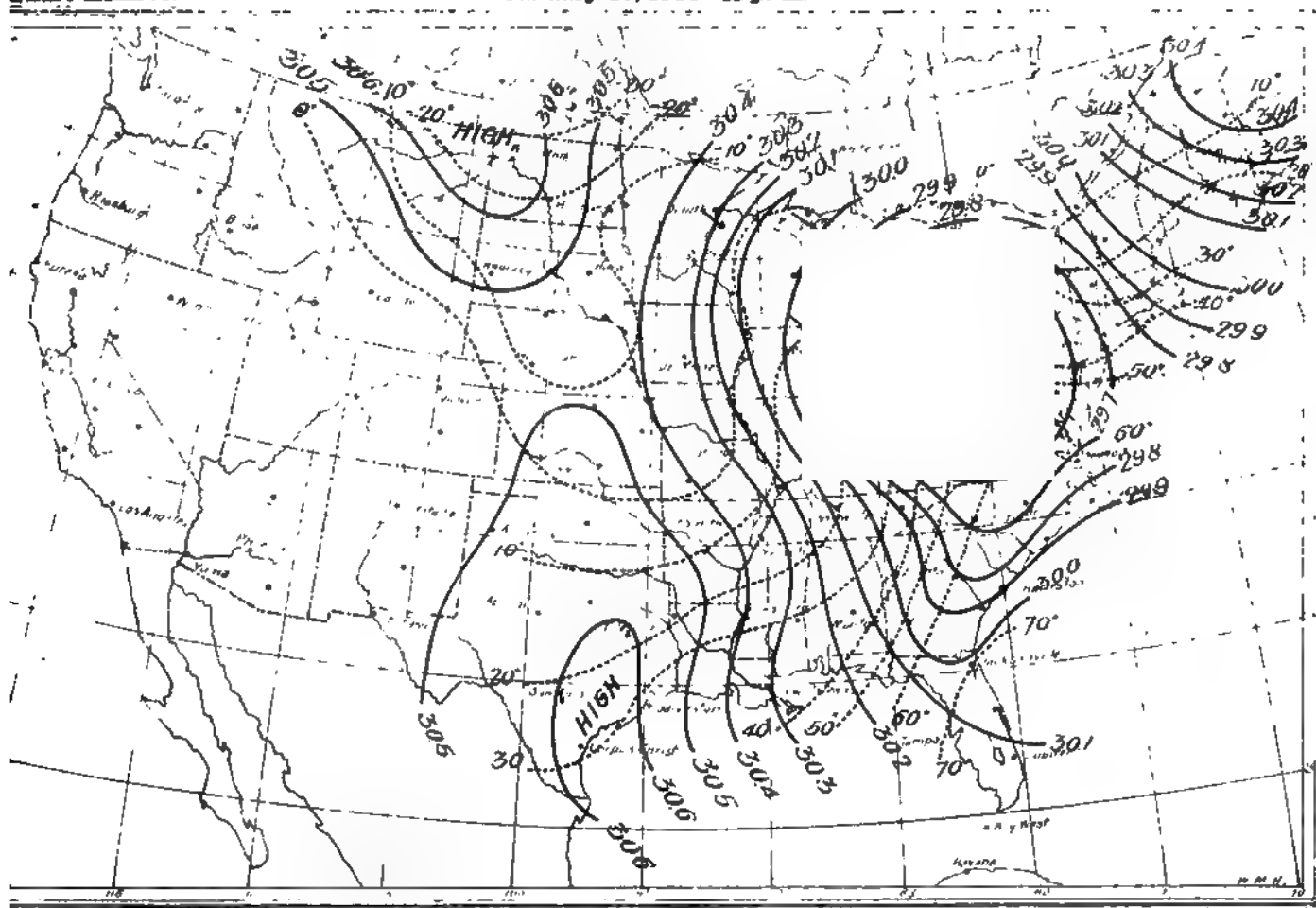


Chart XXXVII.

January 8, 1886—7 a. m.

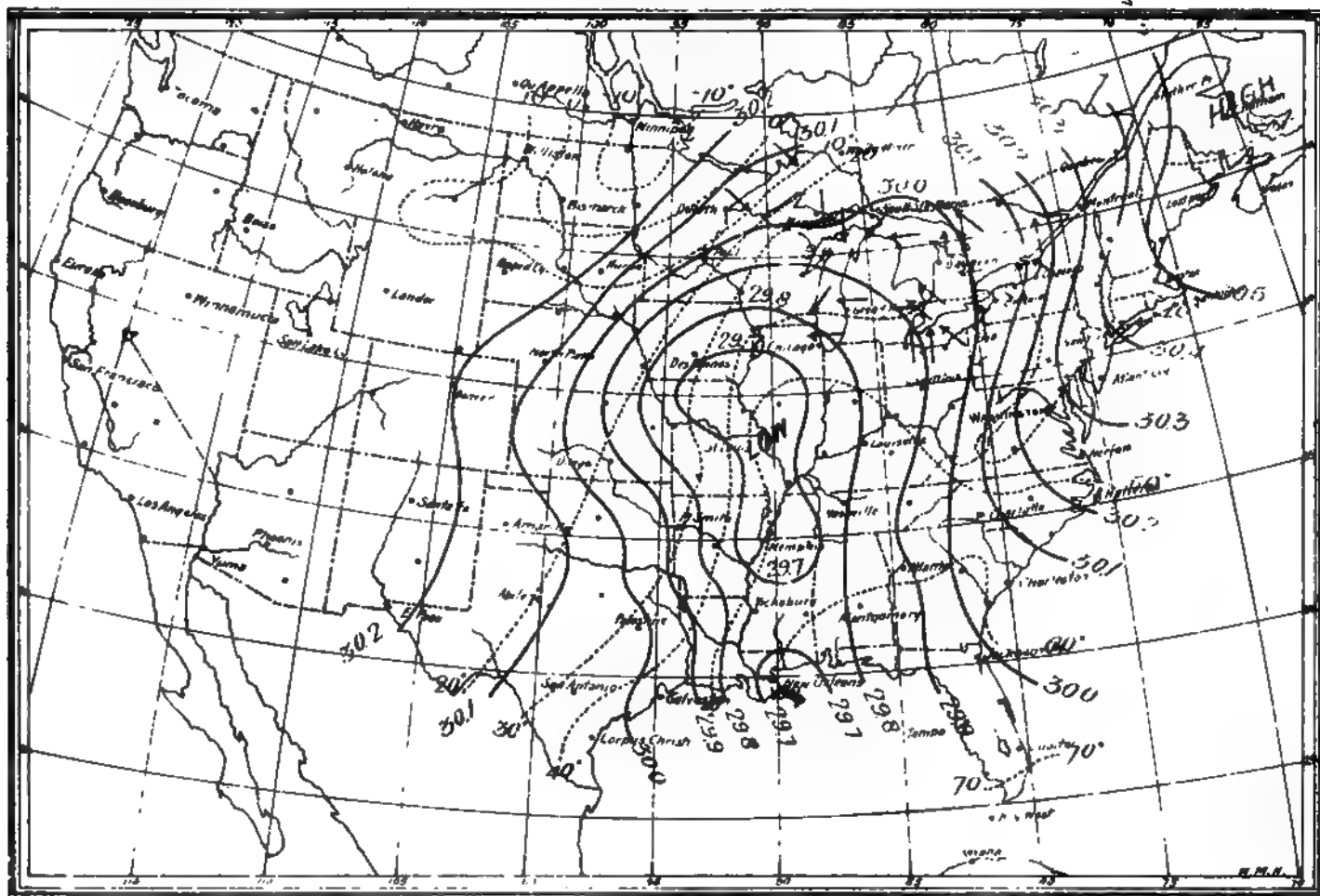


Chart XXXVIII

January 8, 1886—11 p. m.



Chart XXXIX.

January 4, 1886—7 a. m.

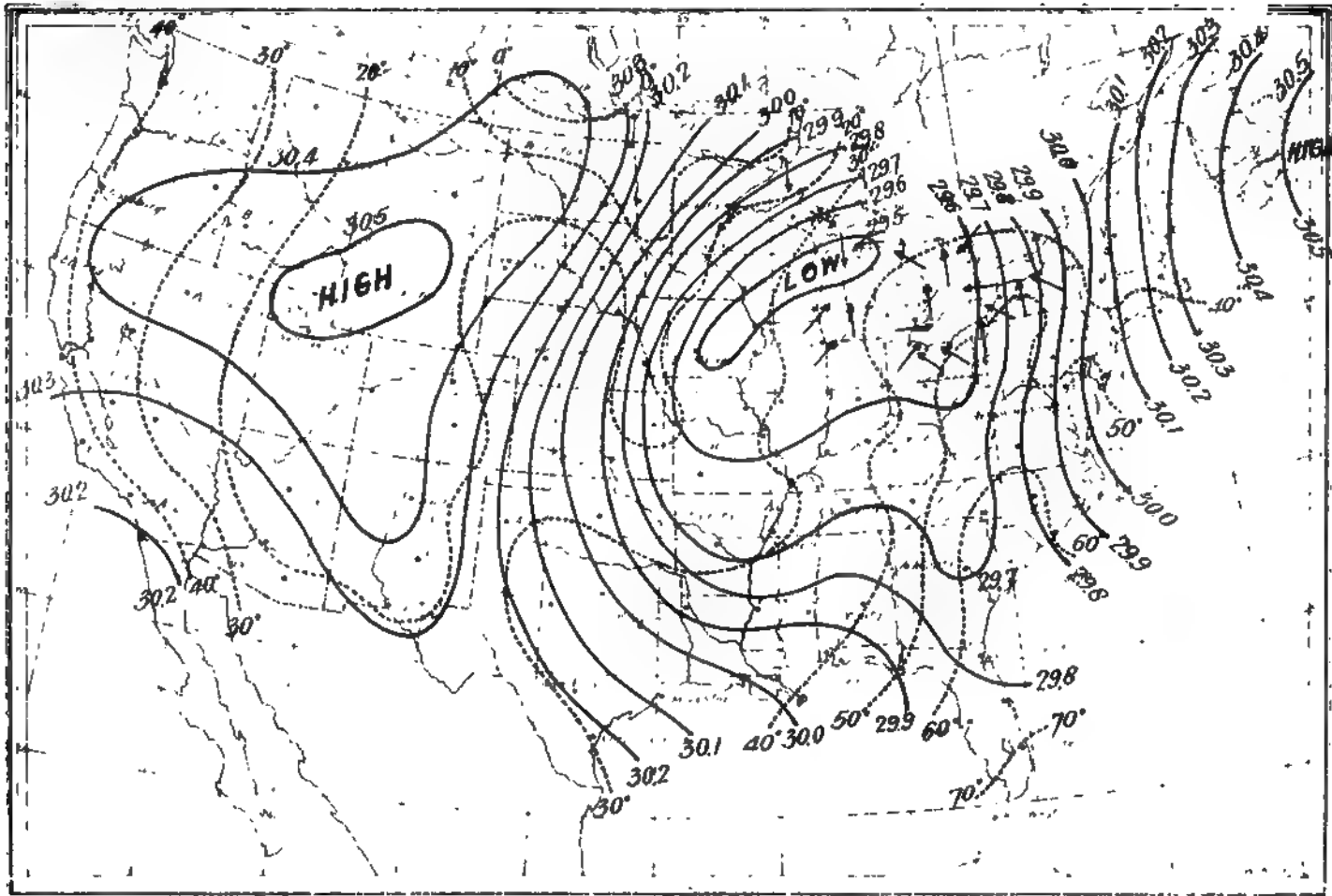


Chart XL.

January 4, 1886—3 p. m.

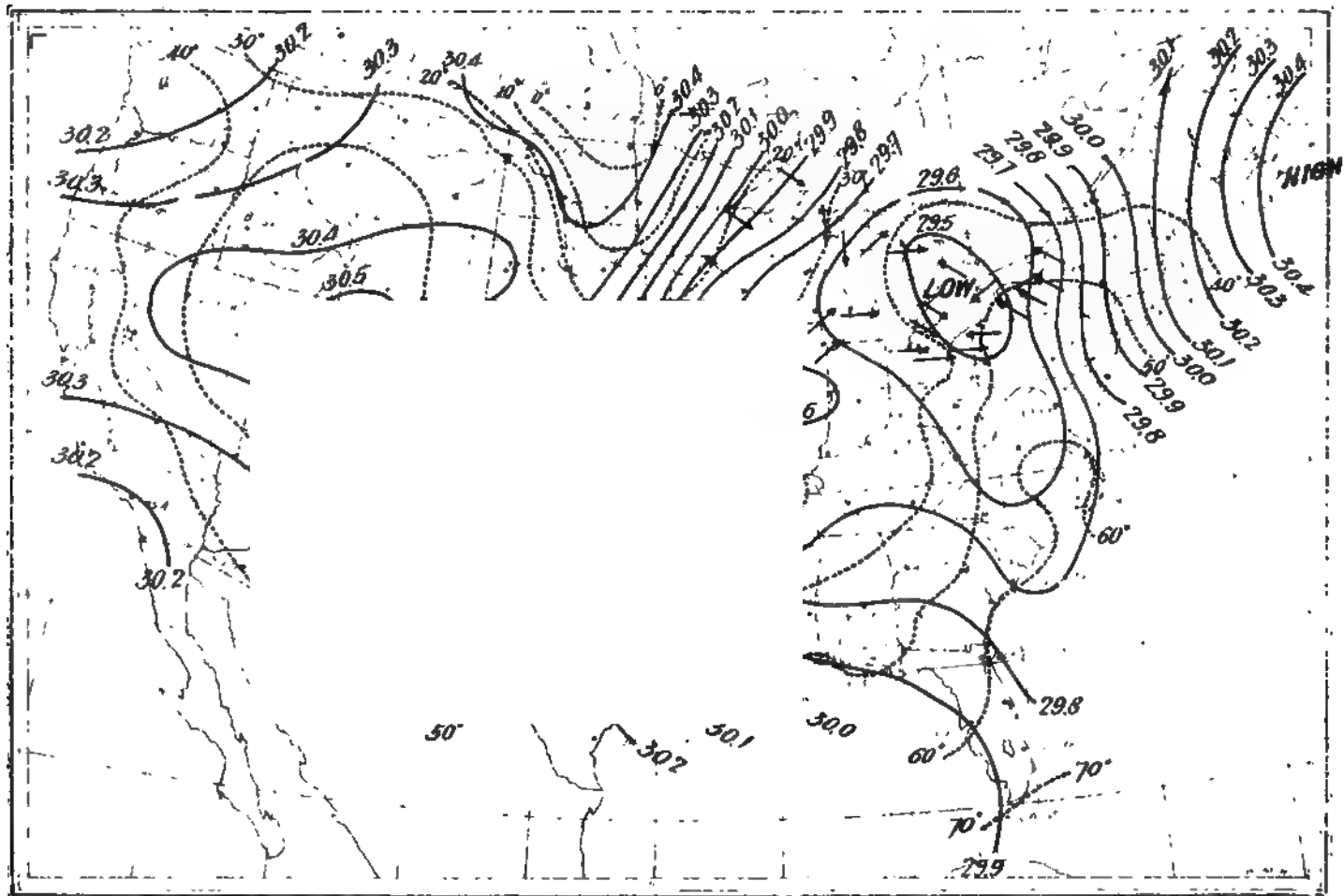


Chart XLII

January 16, 1887-7 a. m.

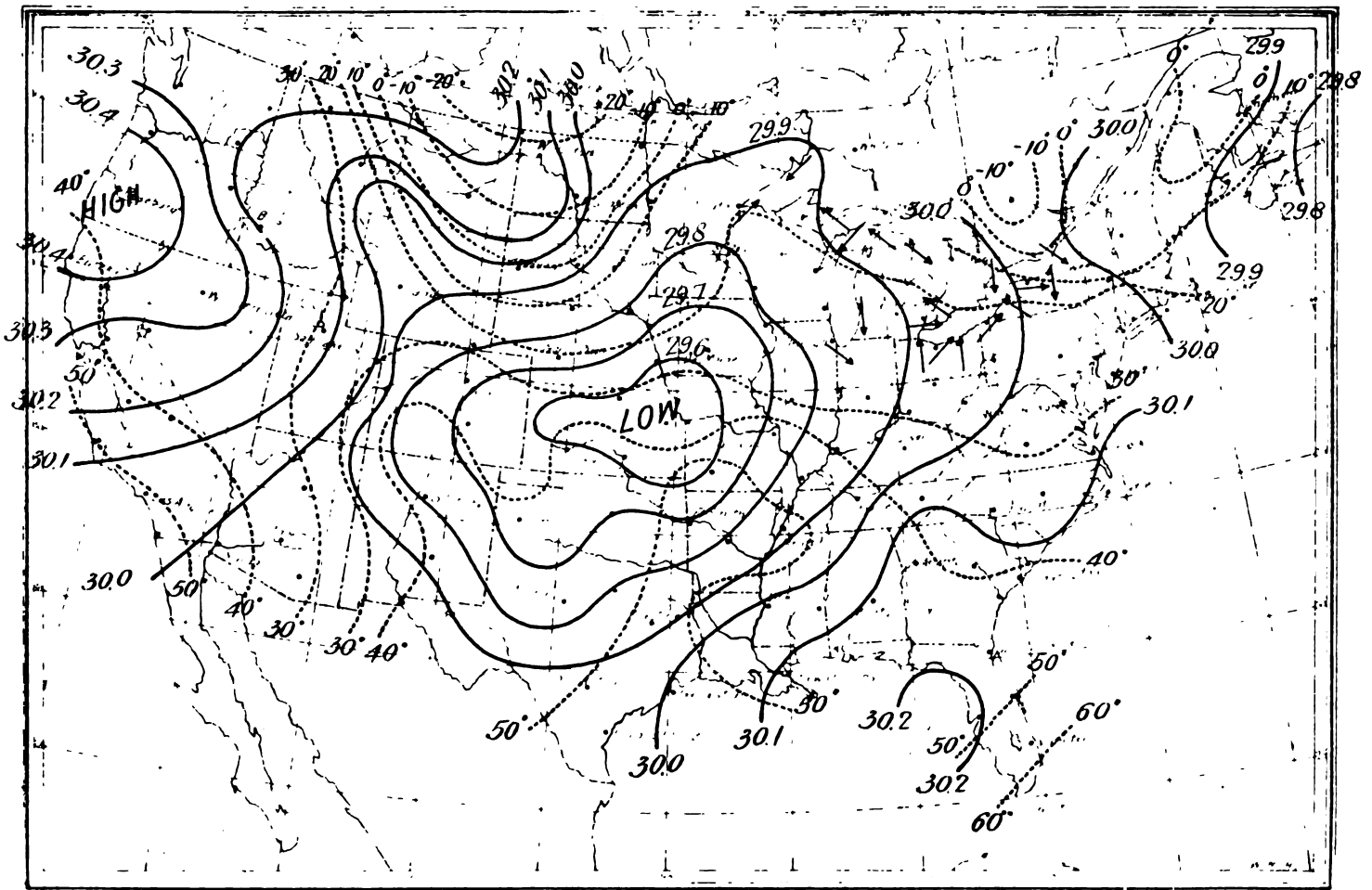


Chart XLIII

January 16, 1887-3 p. m.

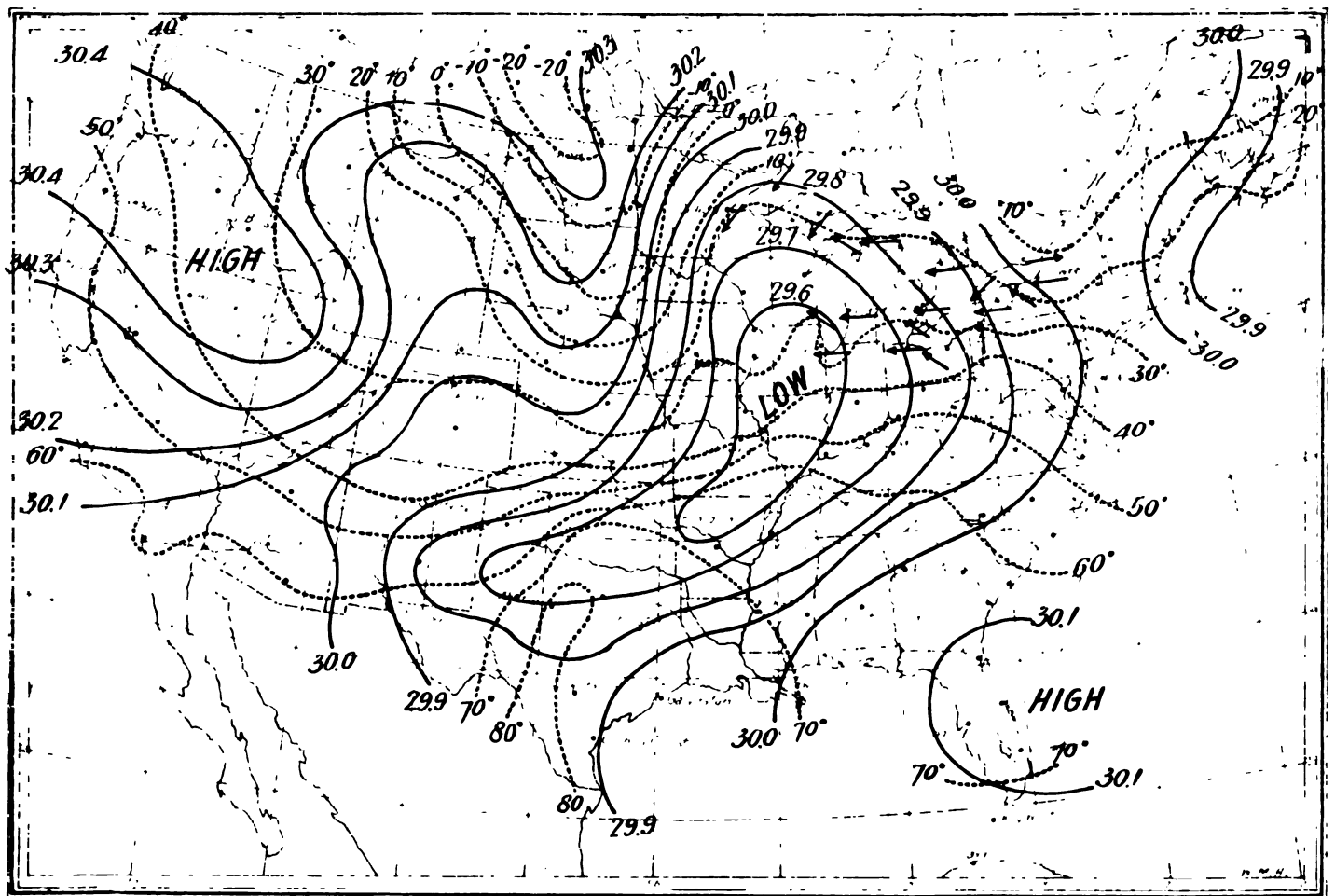


Chart XLIII.

January 16, 1887—11 p. m.

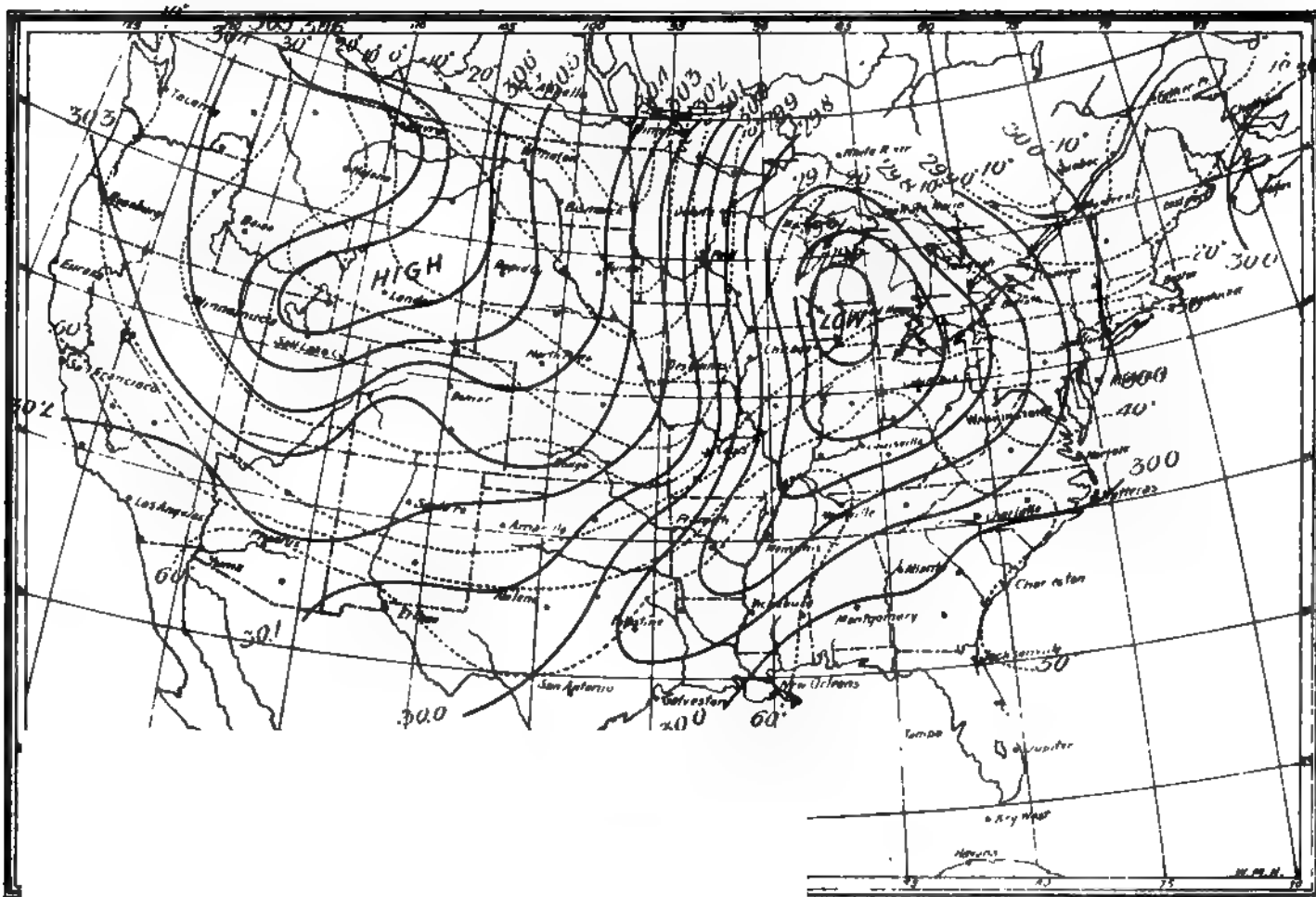


Chart XLIV.

January 17, 1887—7 a. m.

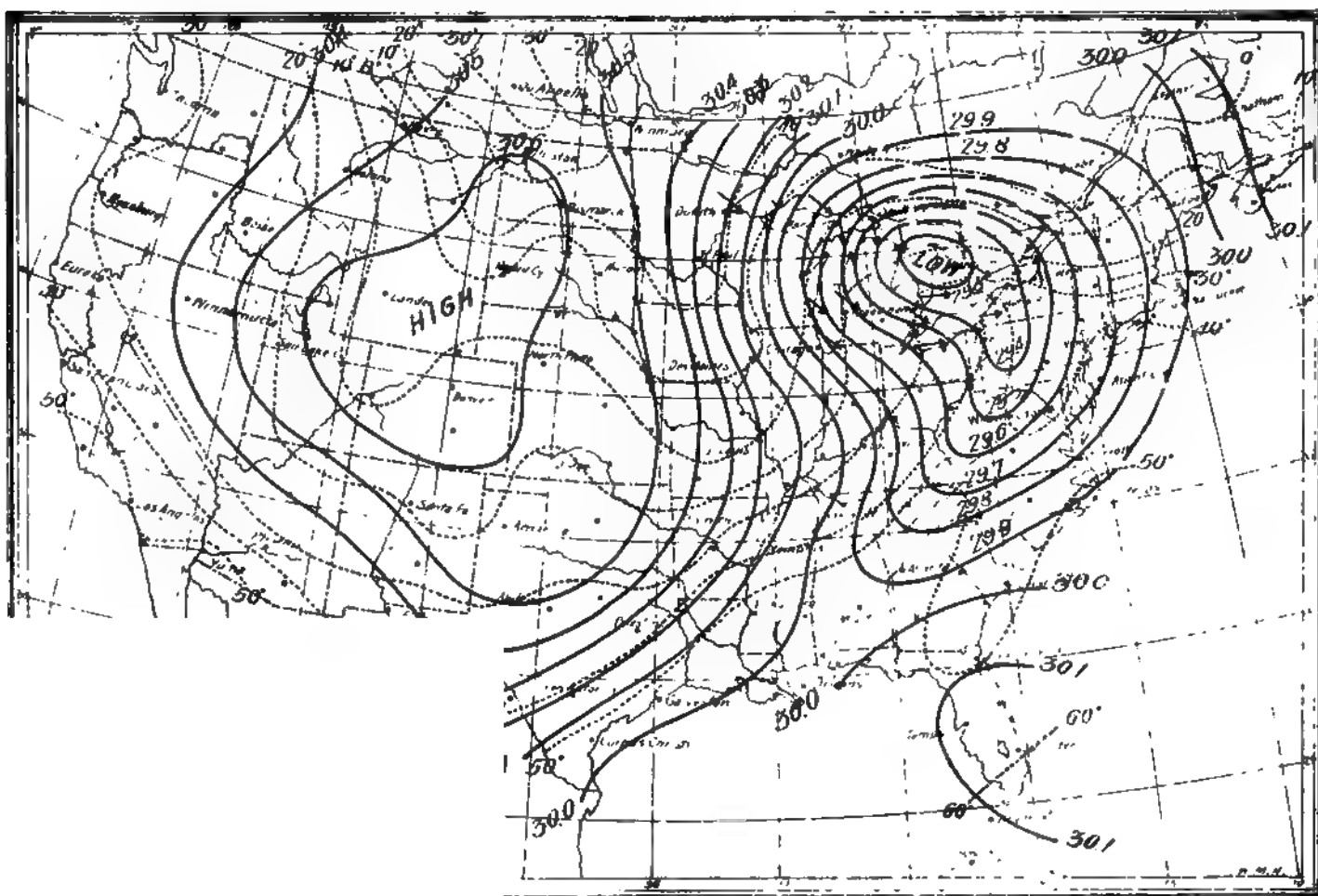


Chart XLV.

January 8, 1889—8 a. m.

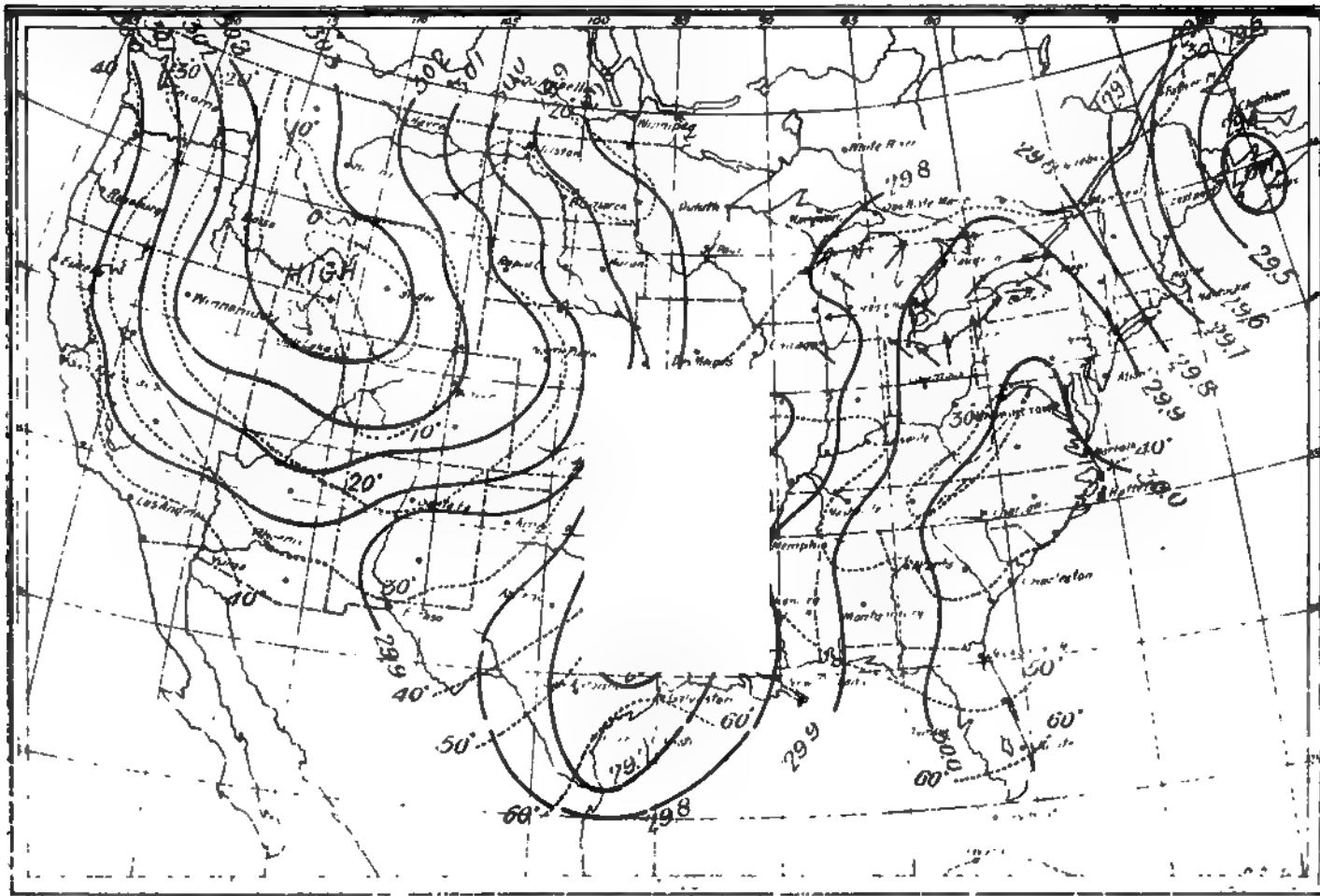
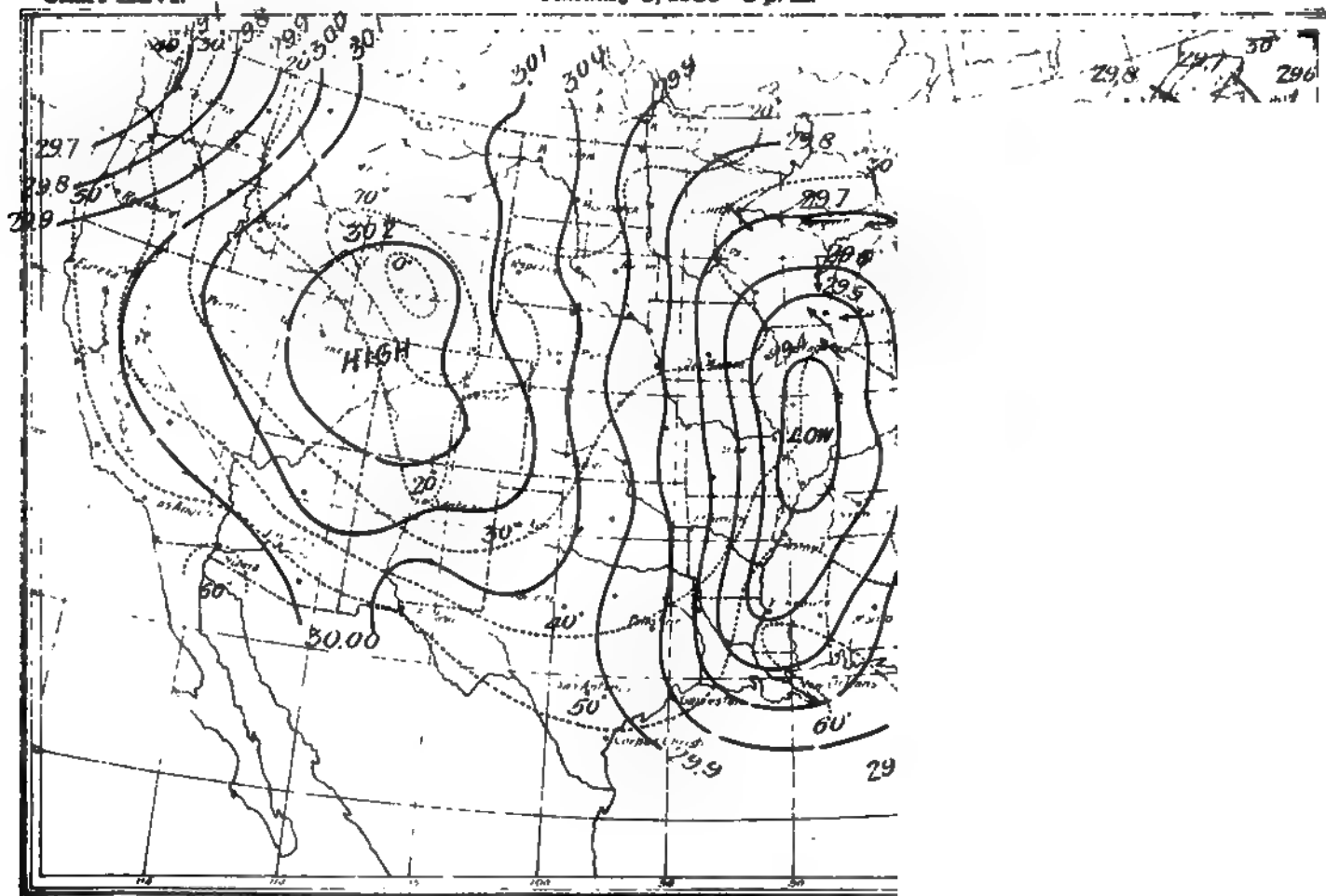


Chart XLVI.

January 8, 1889—8 p. m.



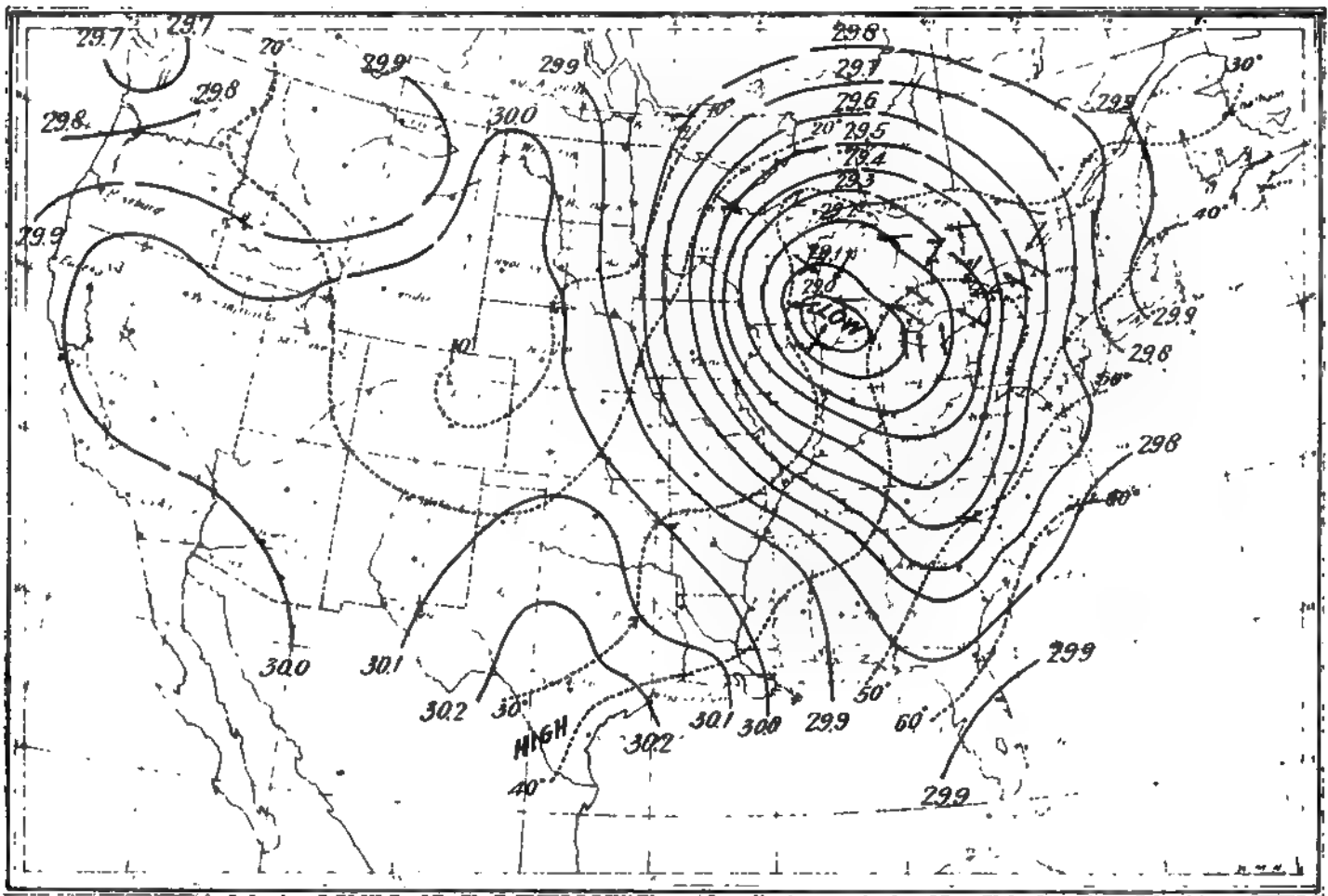
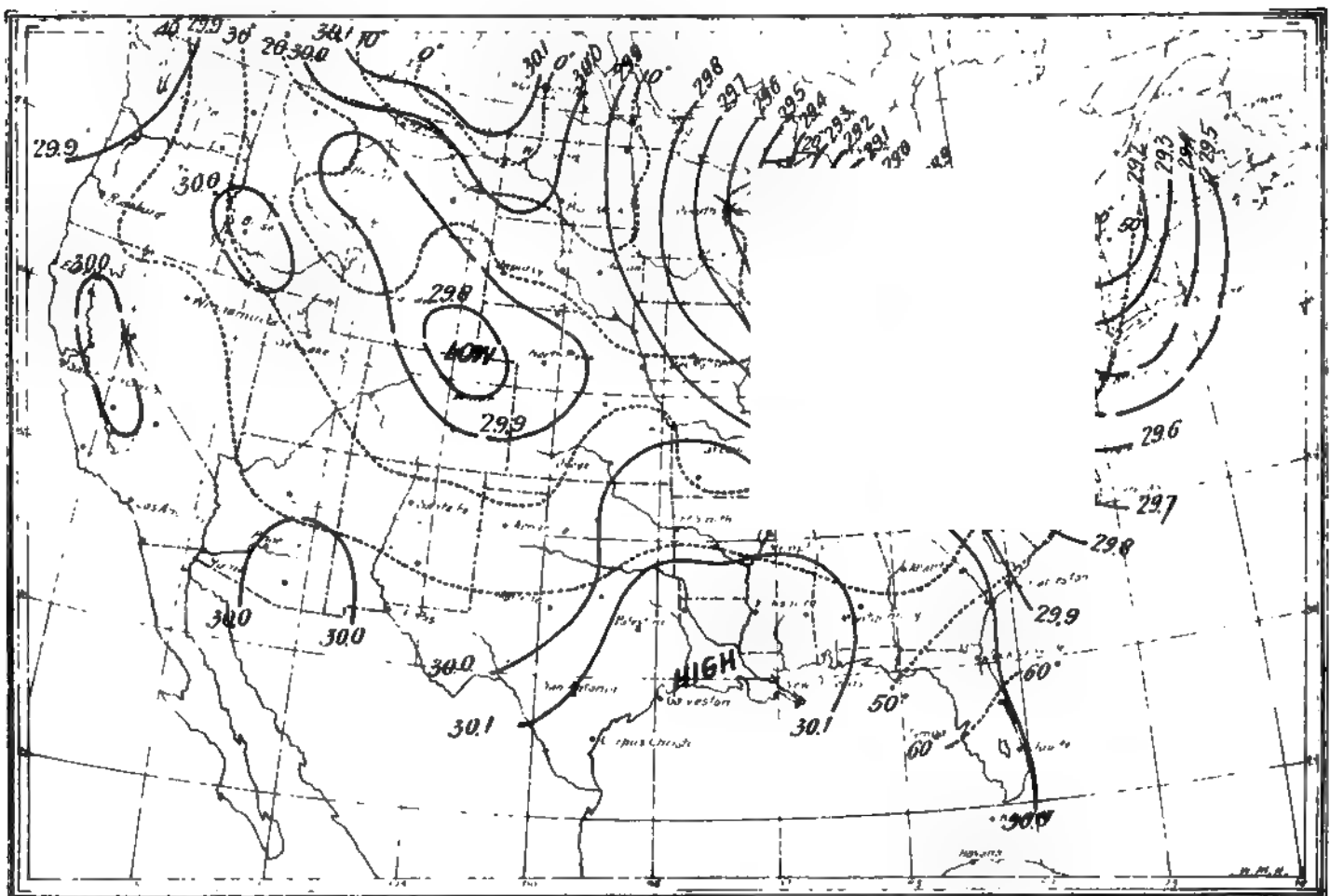


Chart XLVIII.

January 9, 1889—6 p. m.



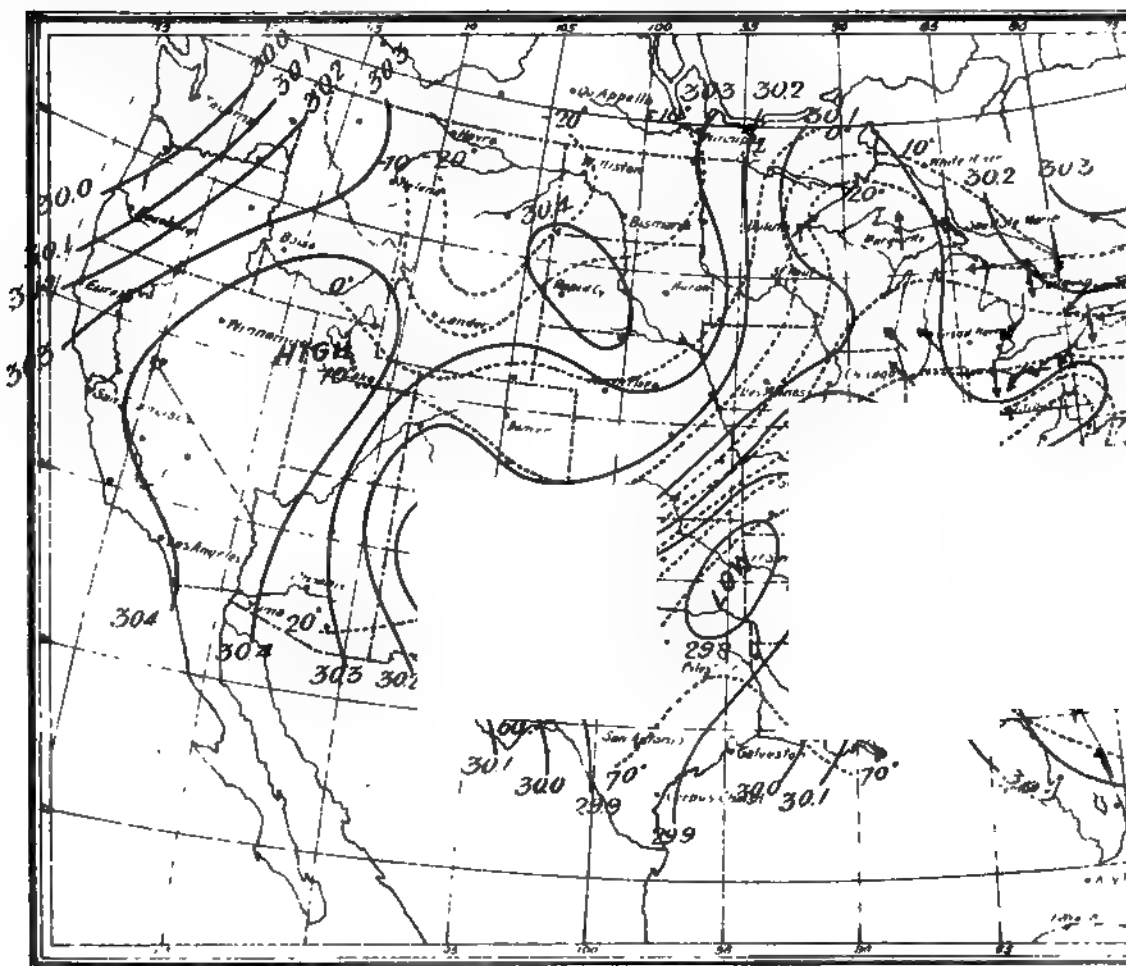
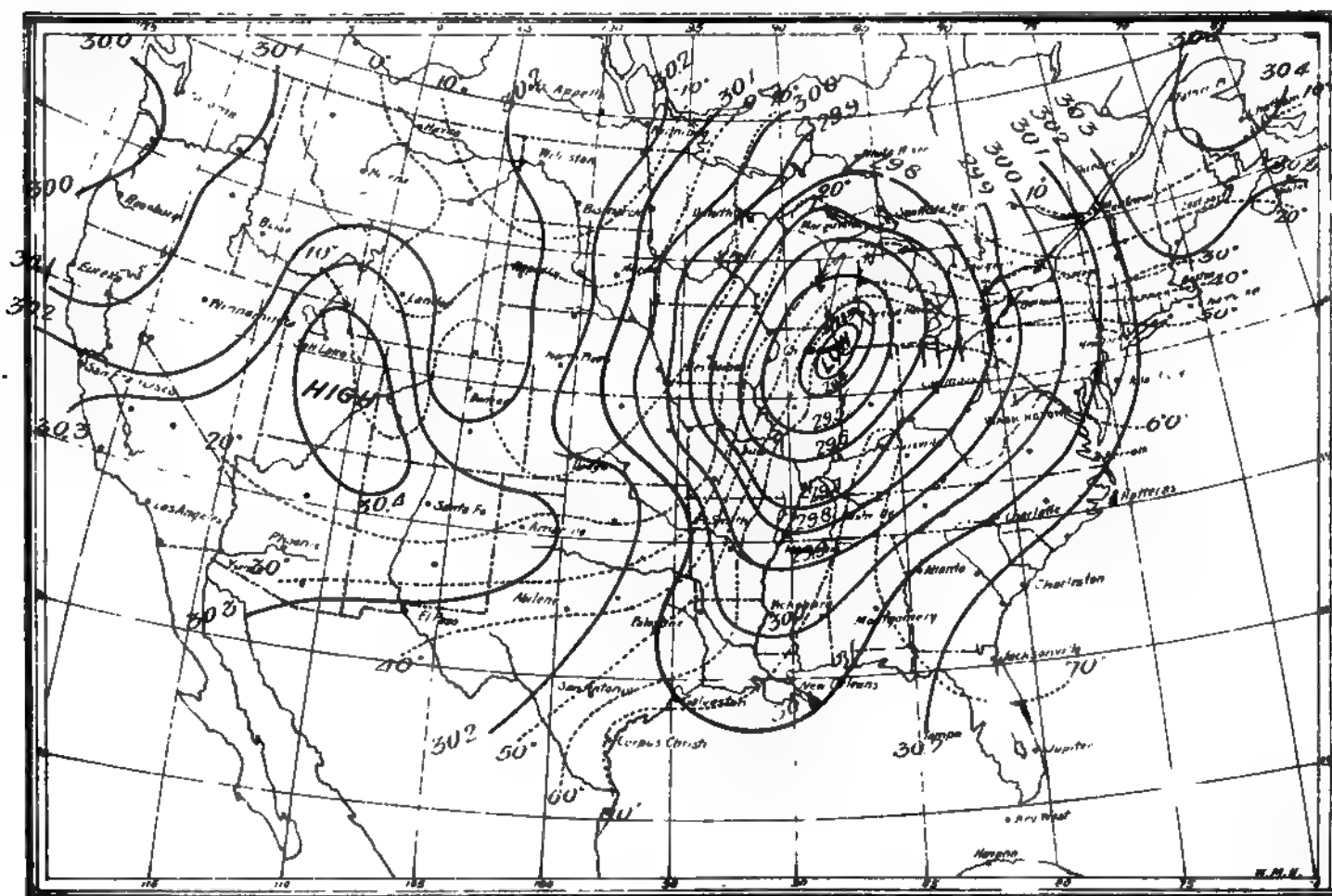
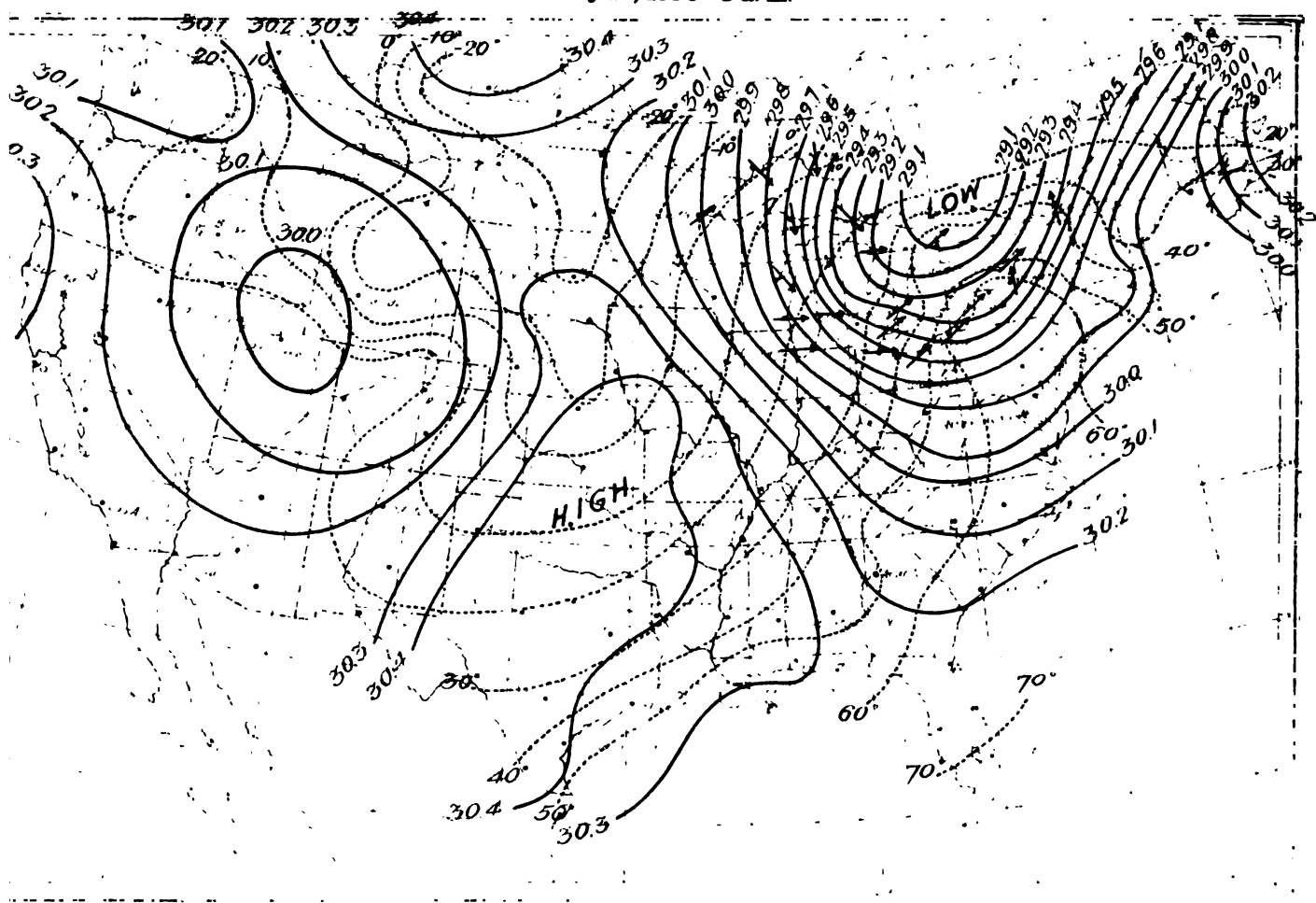


Chart I.

January 12, 1890—8 p. m.



January 13, 1890—8 a. m.



January 13, 1890—8 p. m.

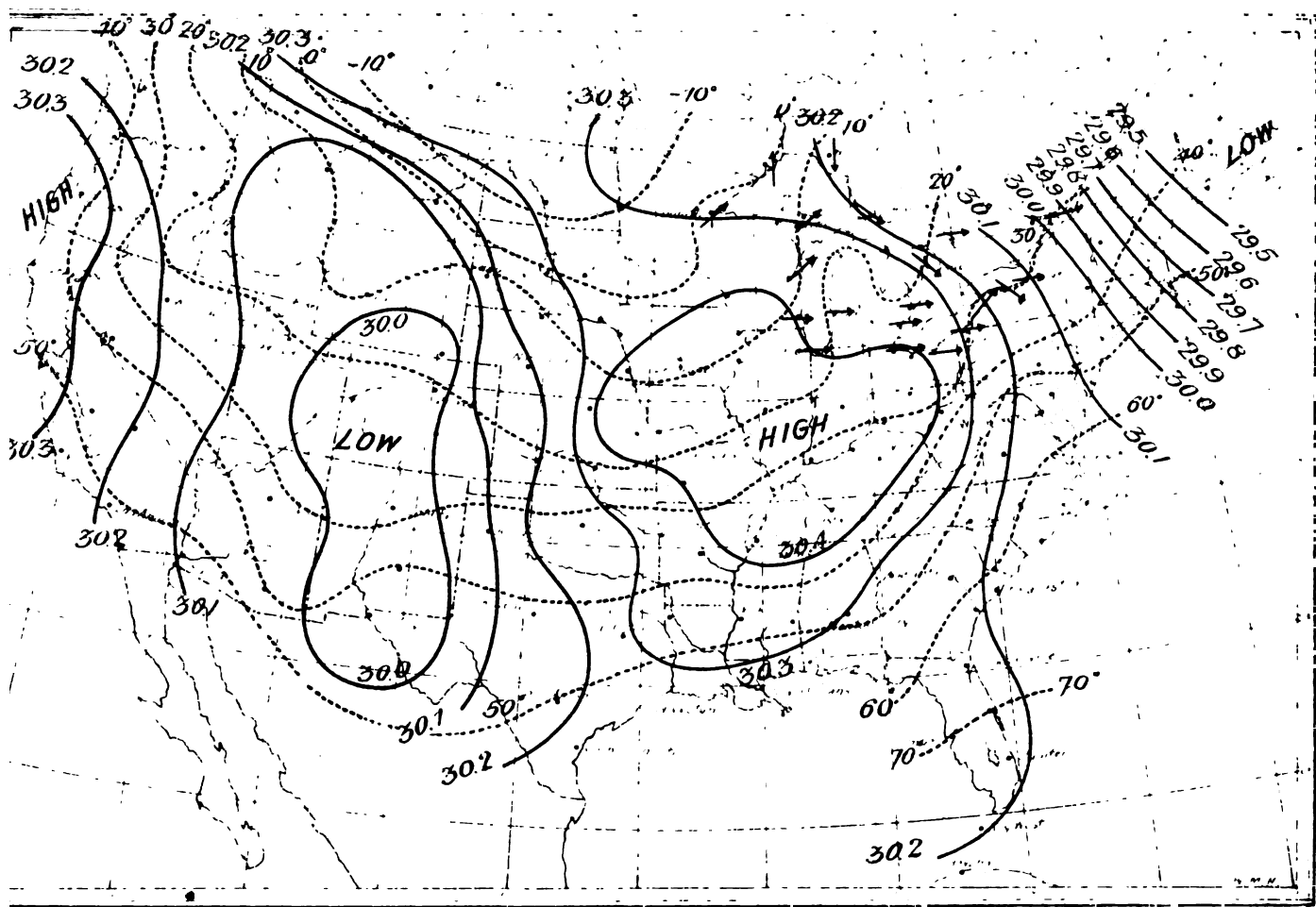


Chart LIII.

January 8, 1893—8 a. m.

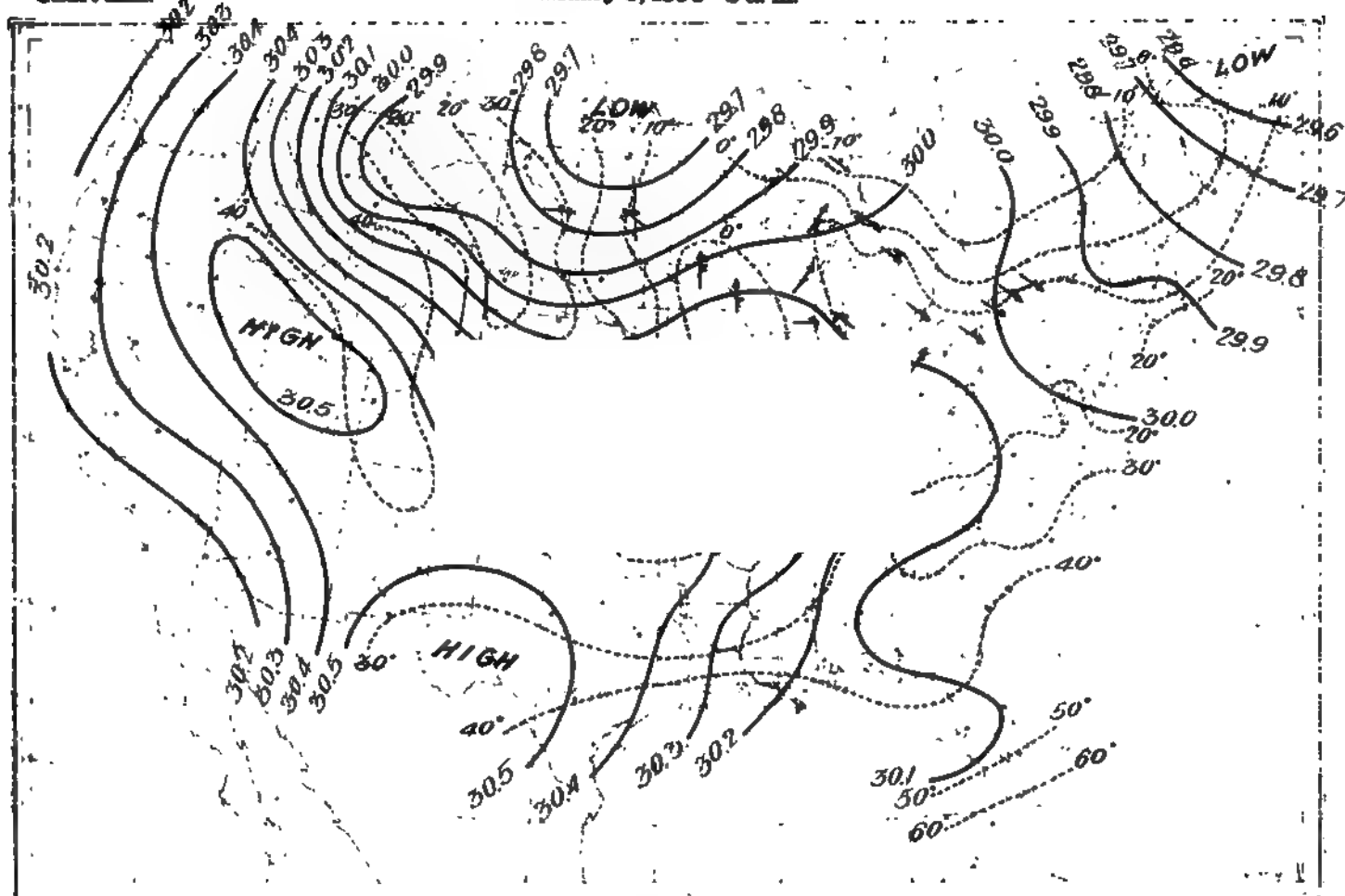
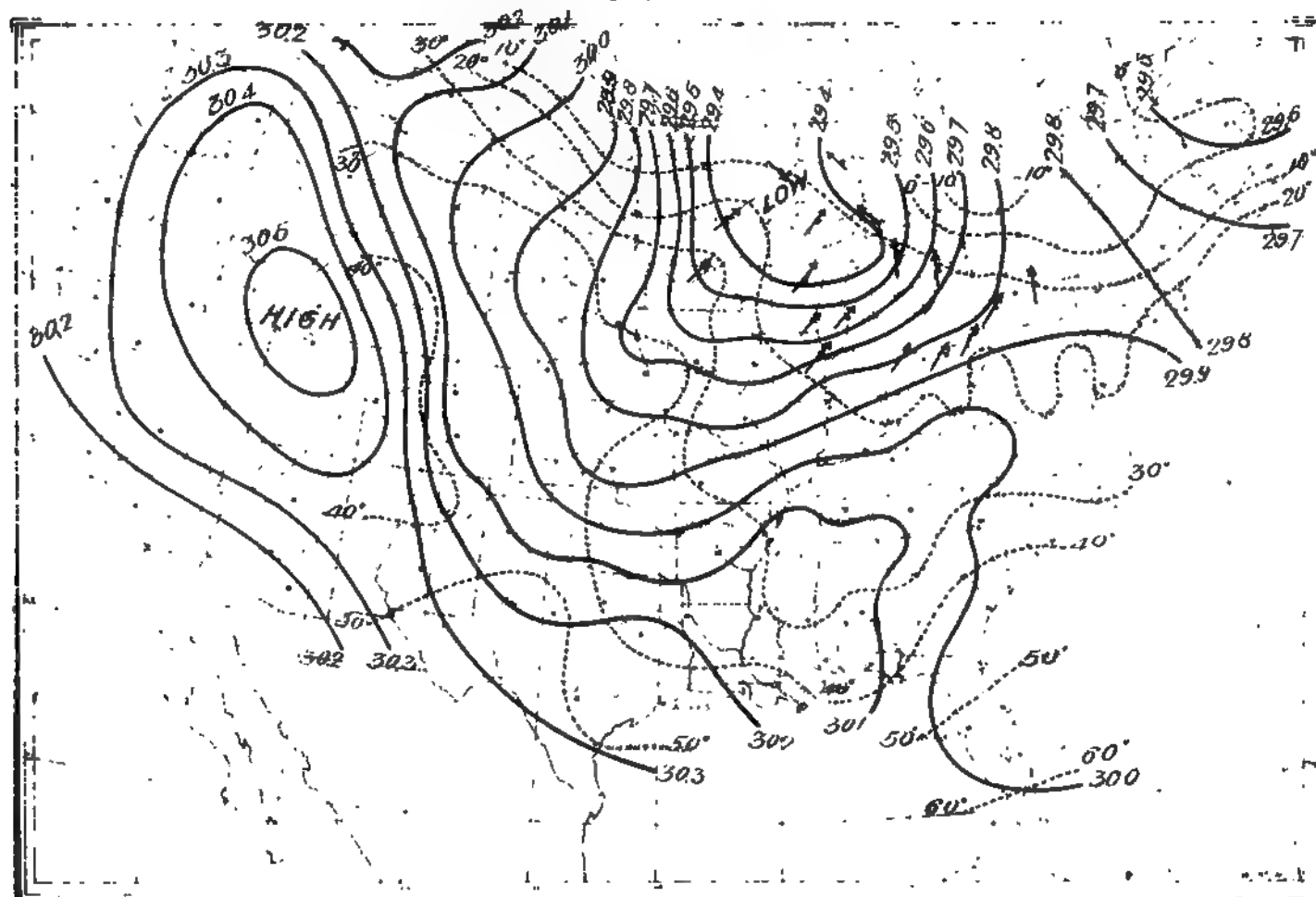


Chart LIV.

January 8, 1898—3 p. m.



January 9, 1893—8 a. m.

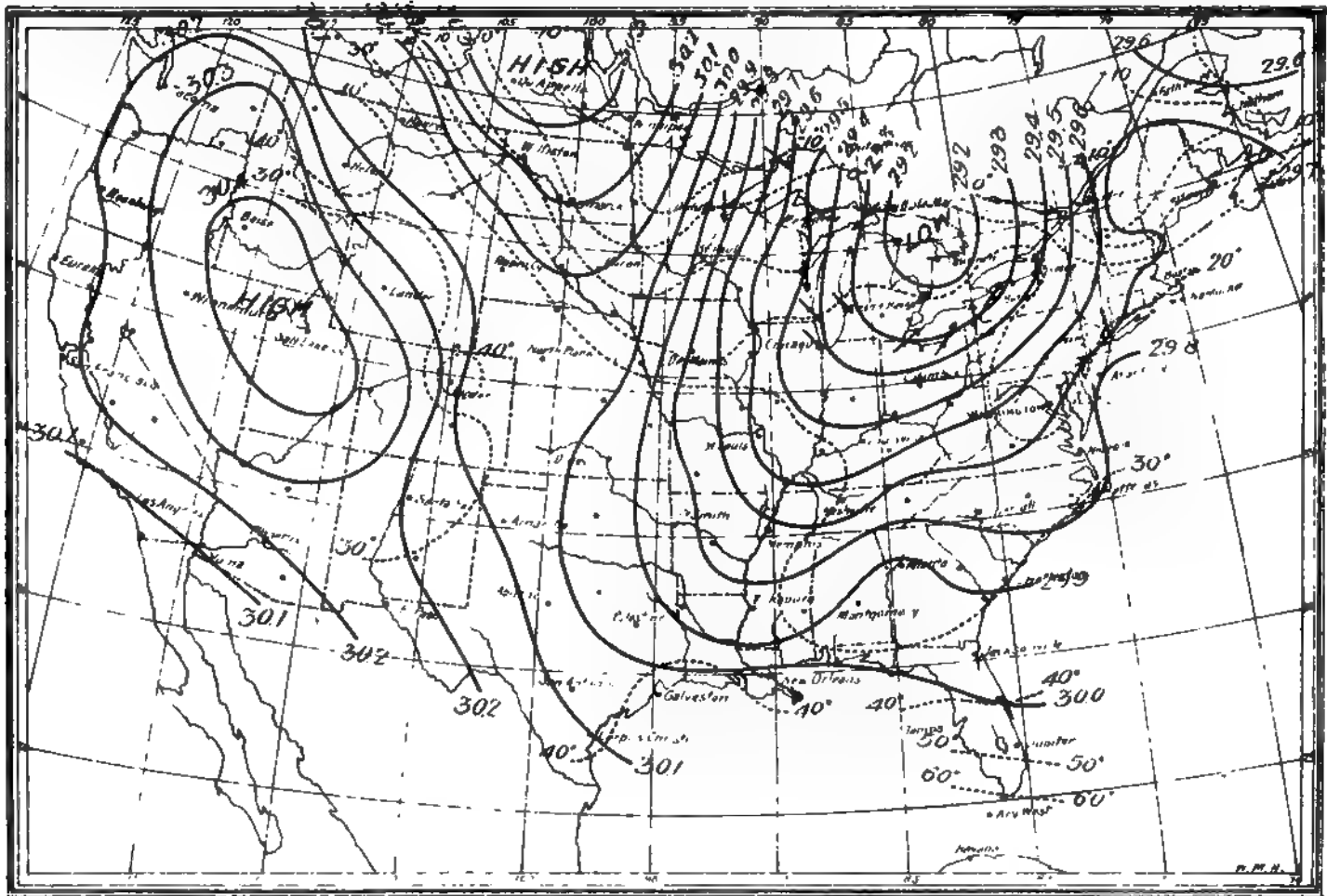
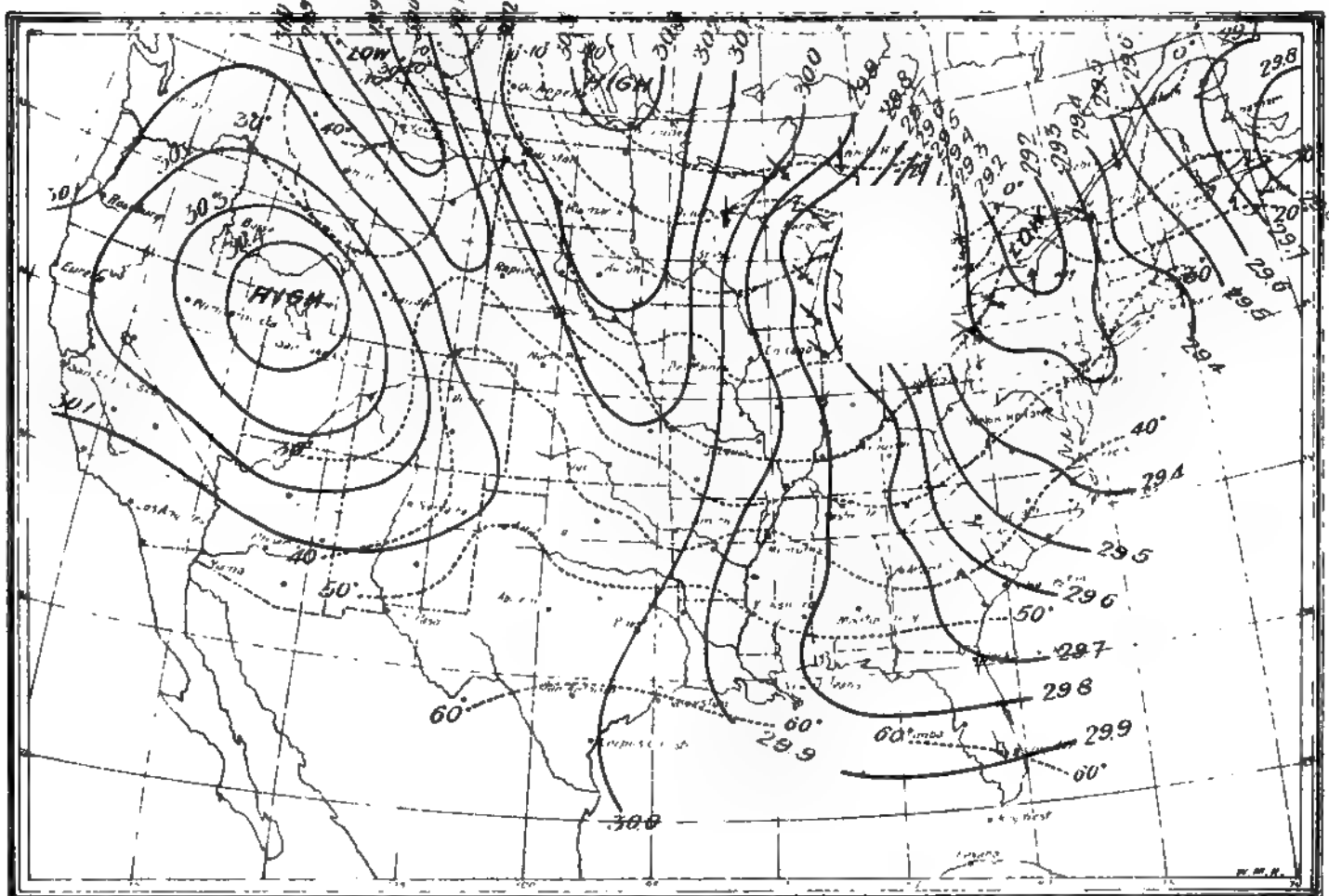
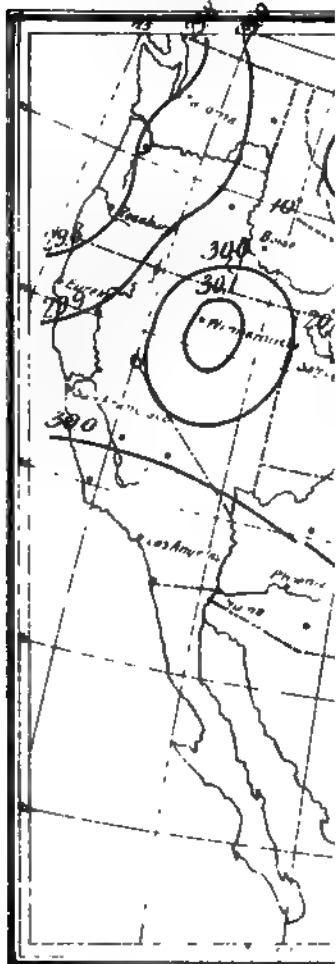


Chart LVI.

January 9, 1893—8 p. m.





January 20, 1895--8 p. m.

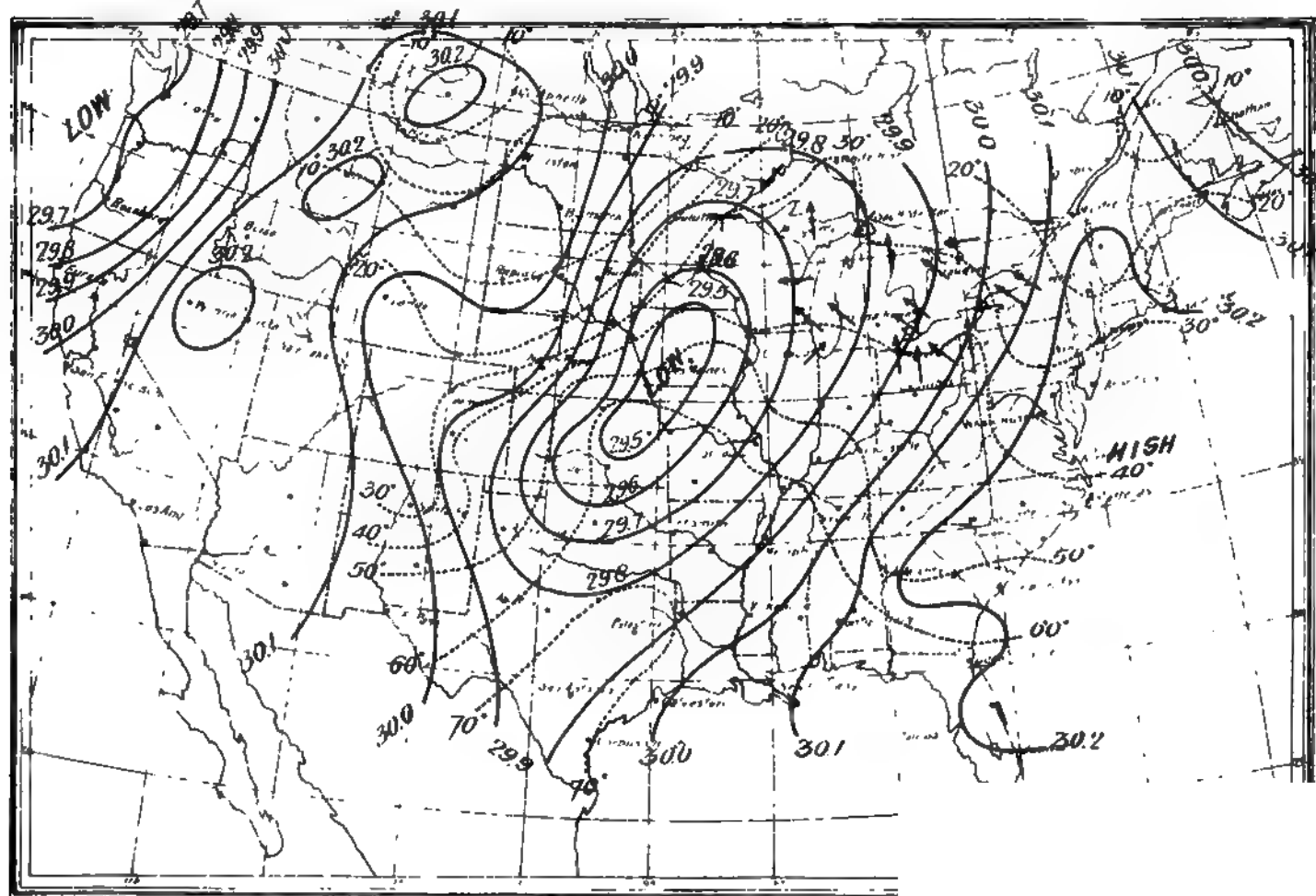


Chart LIX.

January 21, 1895—8 a. m.

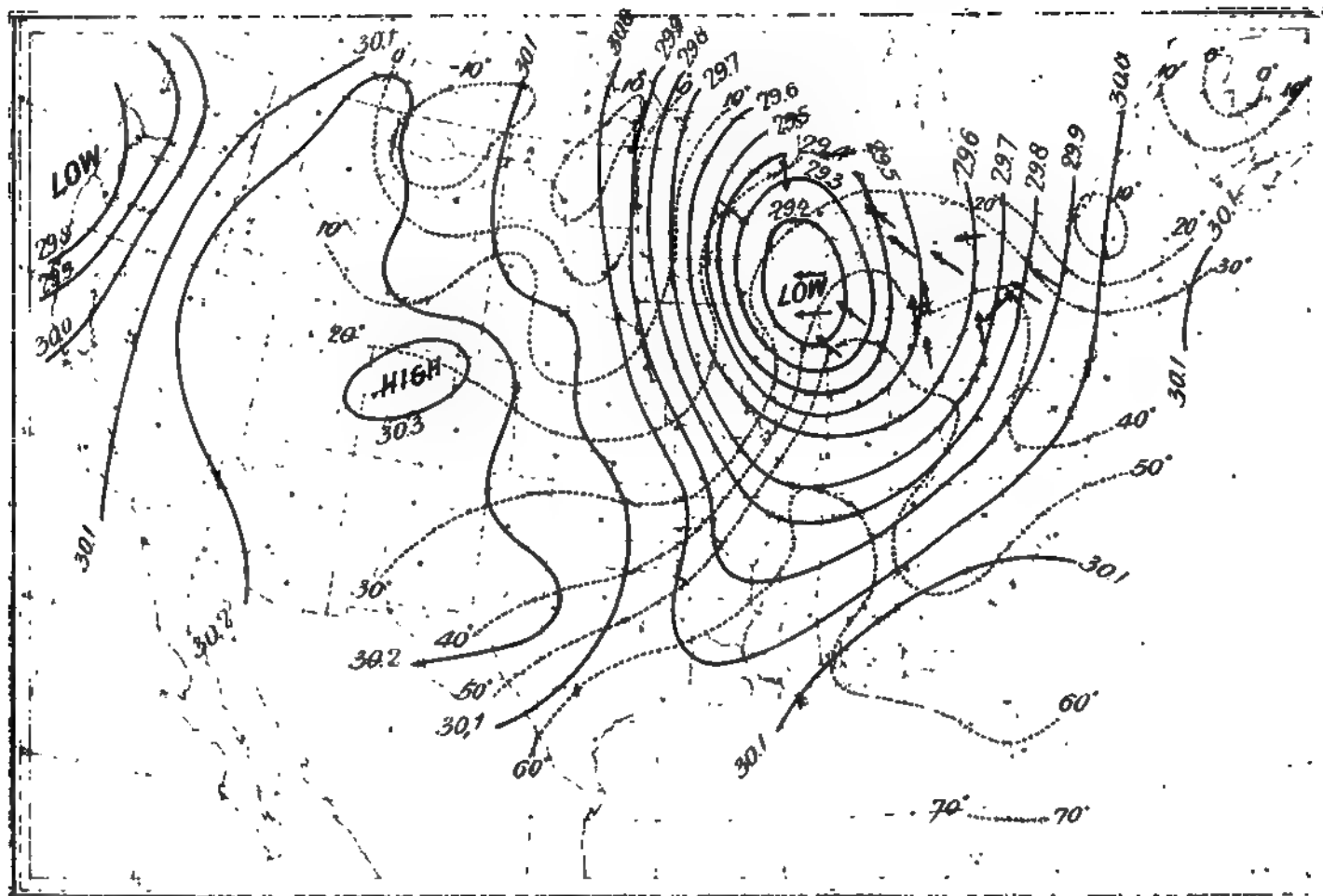
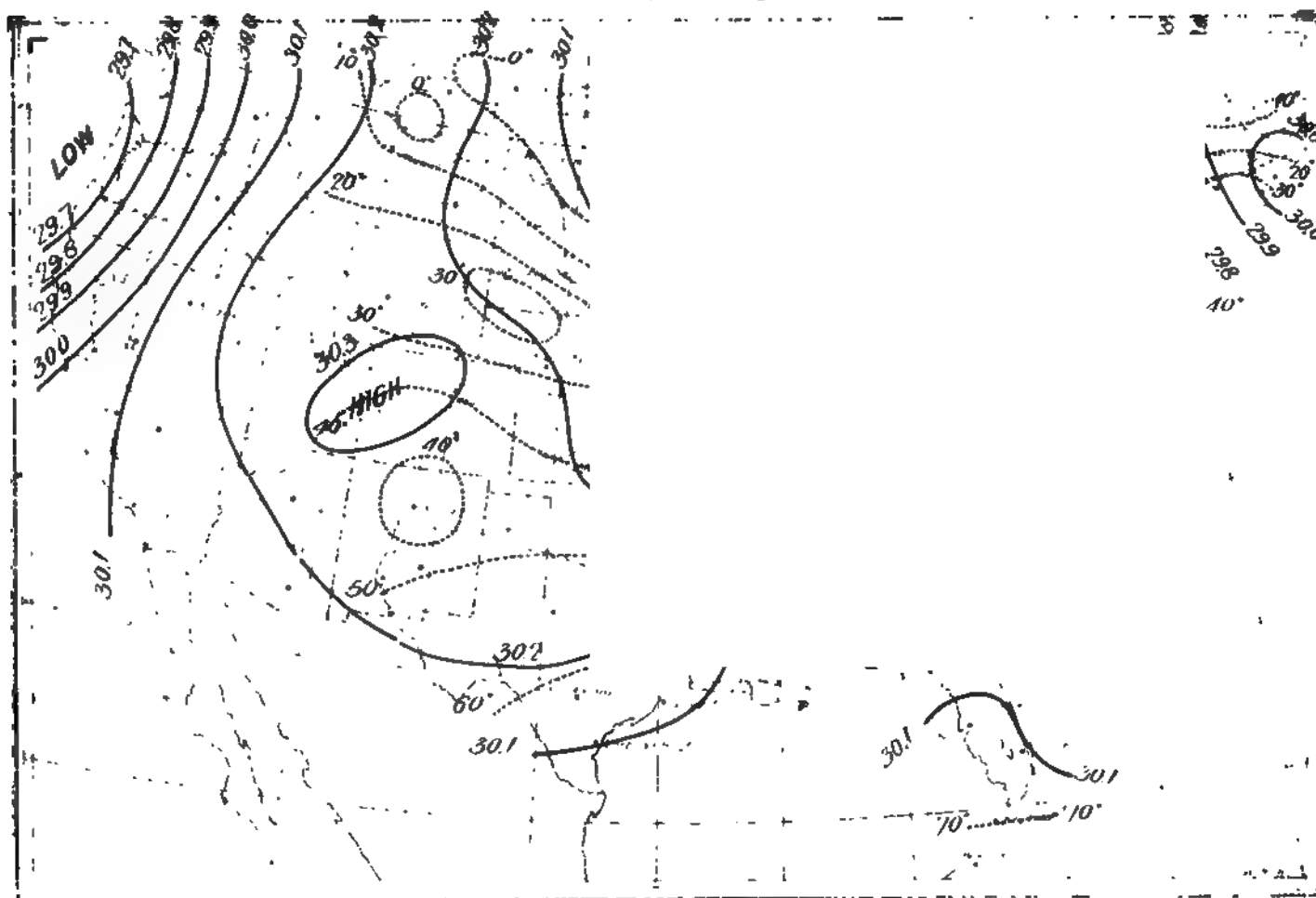


Chart LIX.

January 21, 1895—8 p. m.



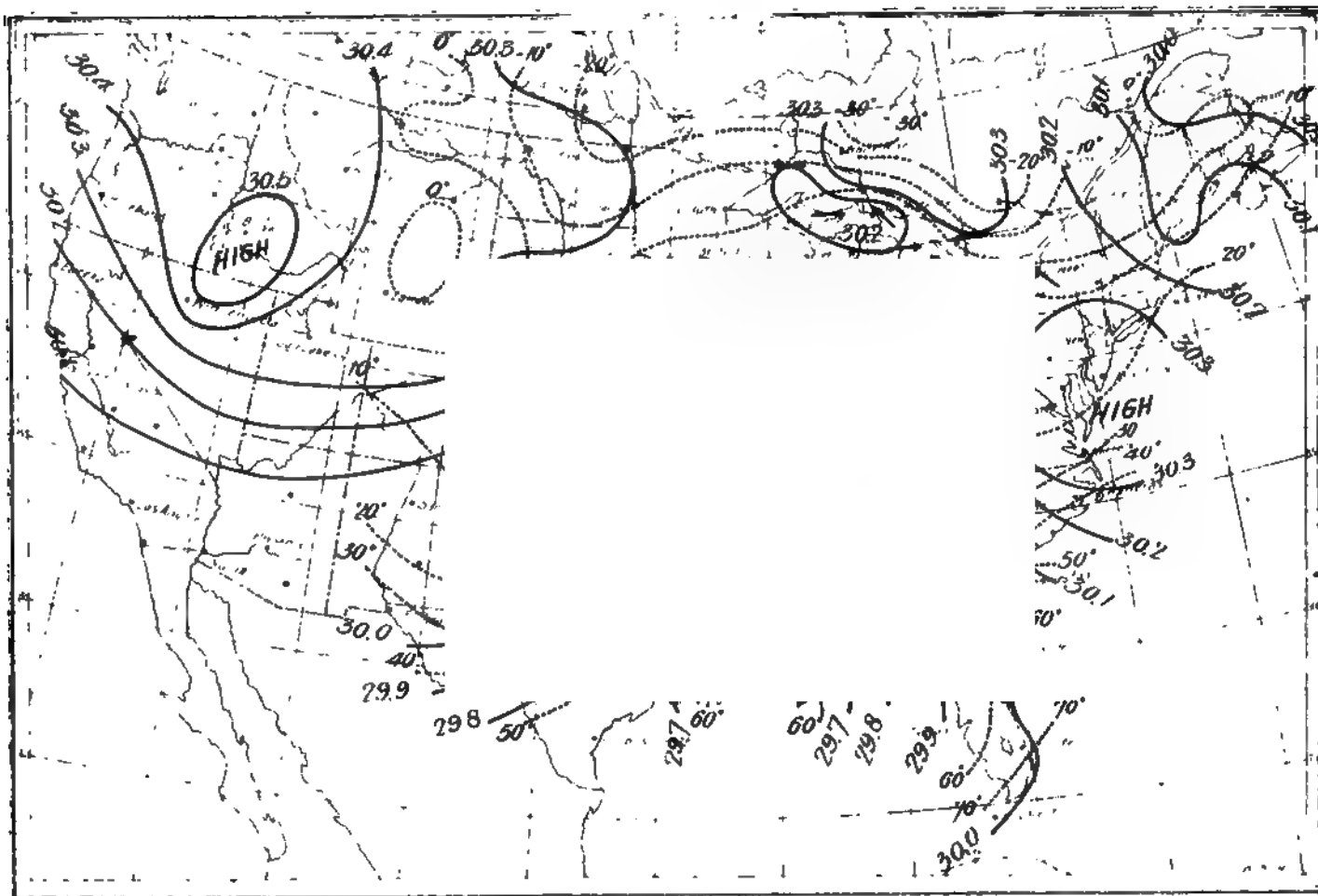


Chart LXII

January 25, 1895—8 p. m.

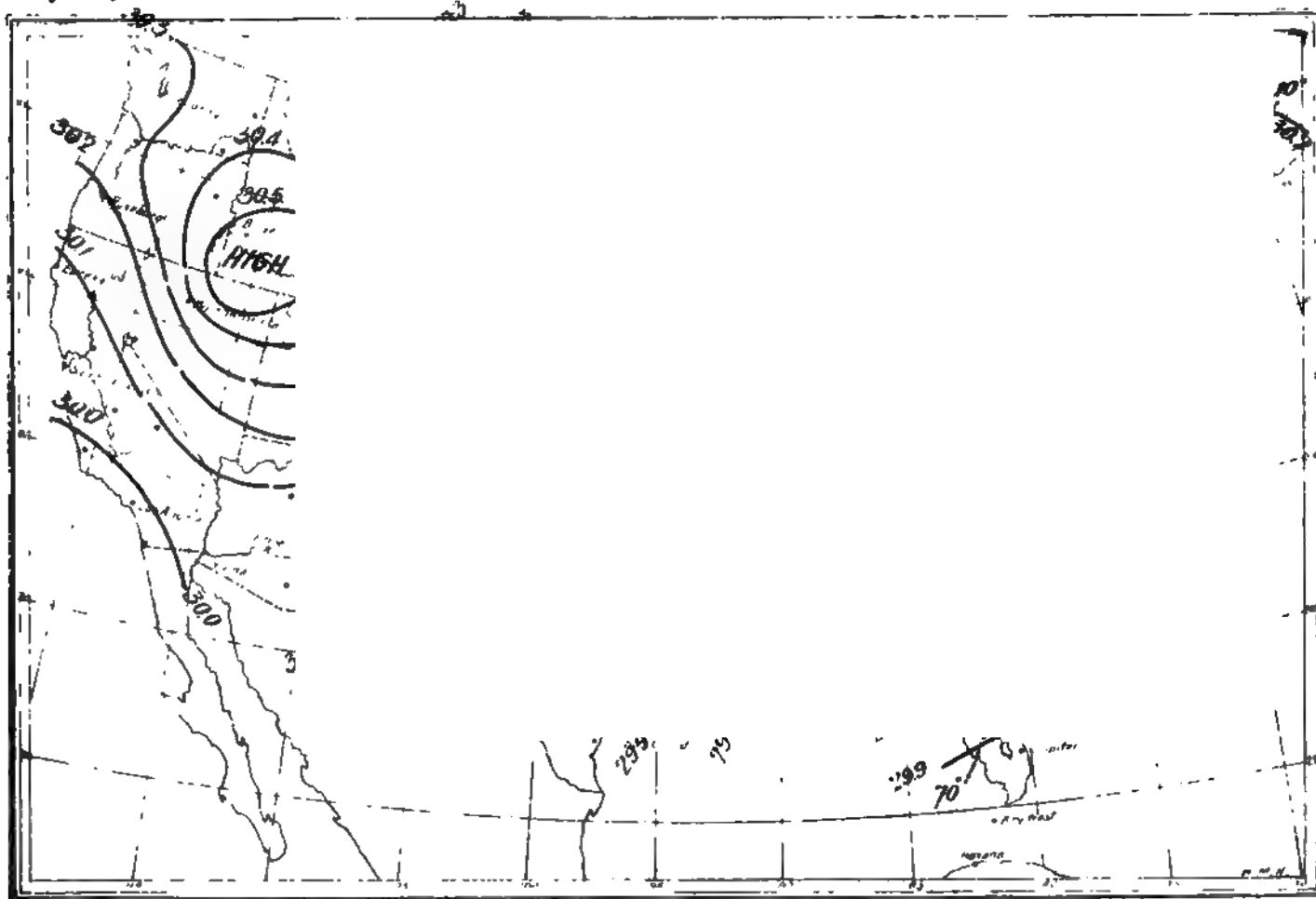


Chart LXIII.

January 26, 1895—8 a. m.

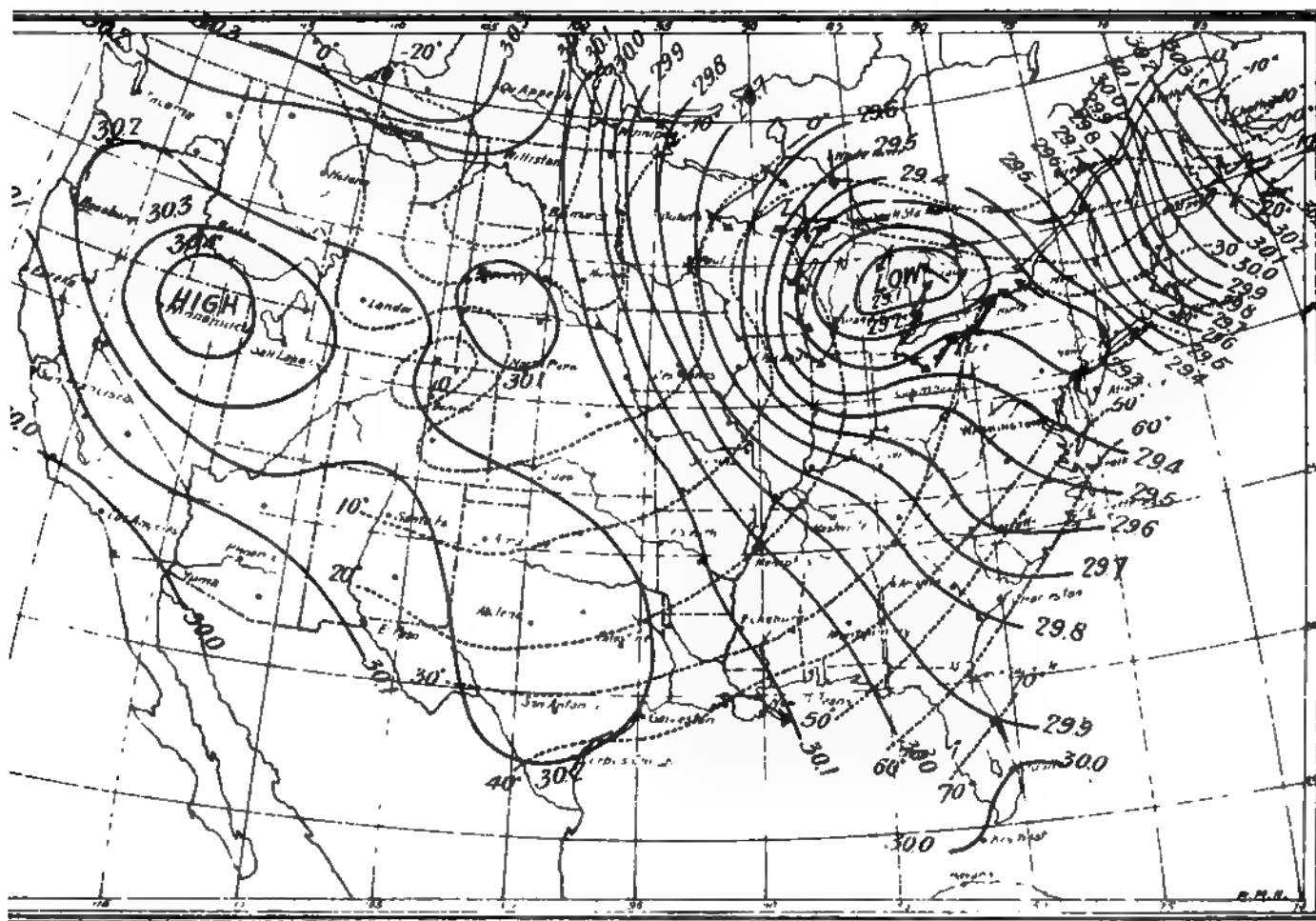


Chart LXIV.

January 26, 1895—8 p. m.

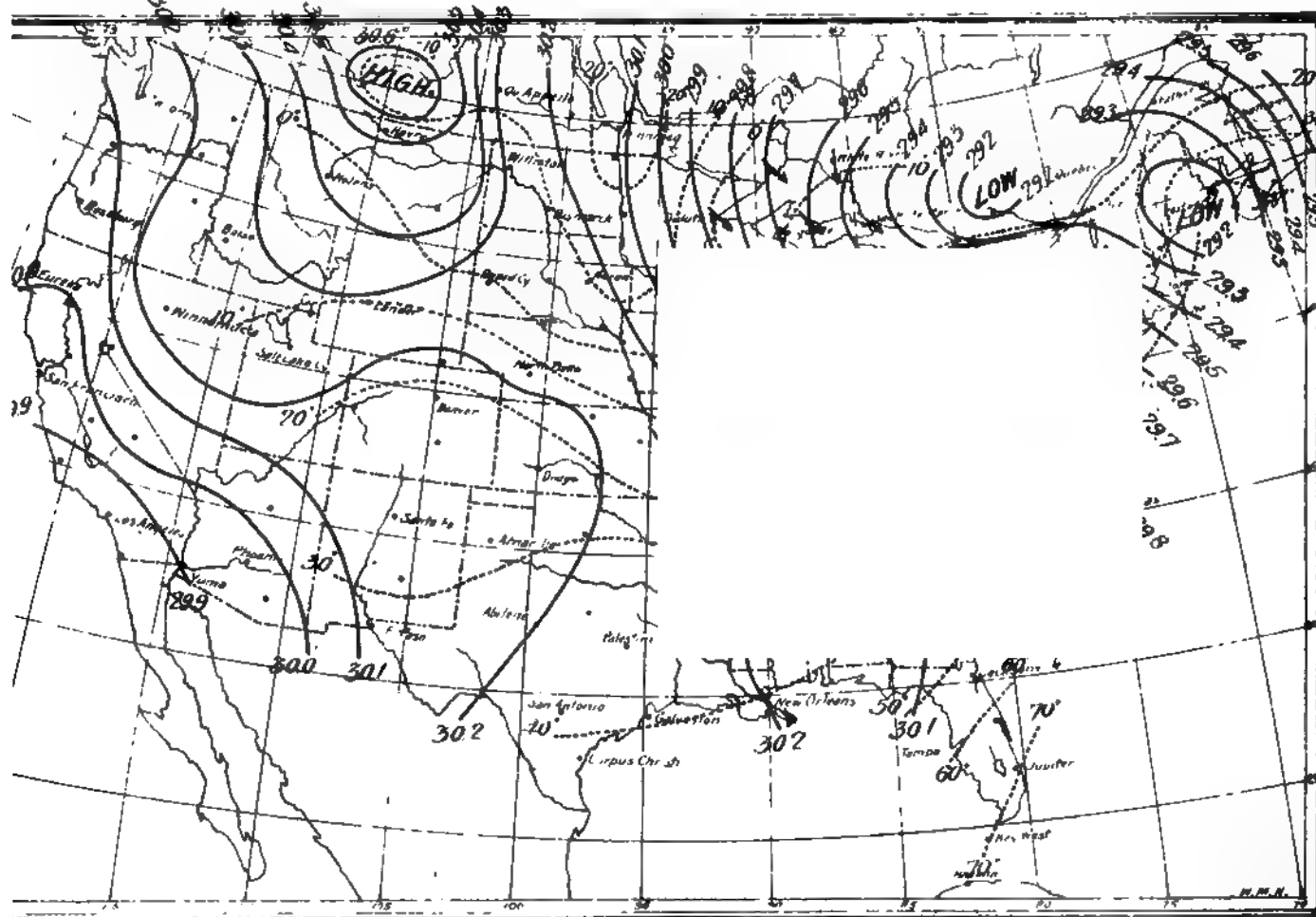


Chart LXV.

January 21, 1898—8 p. m.

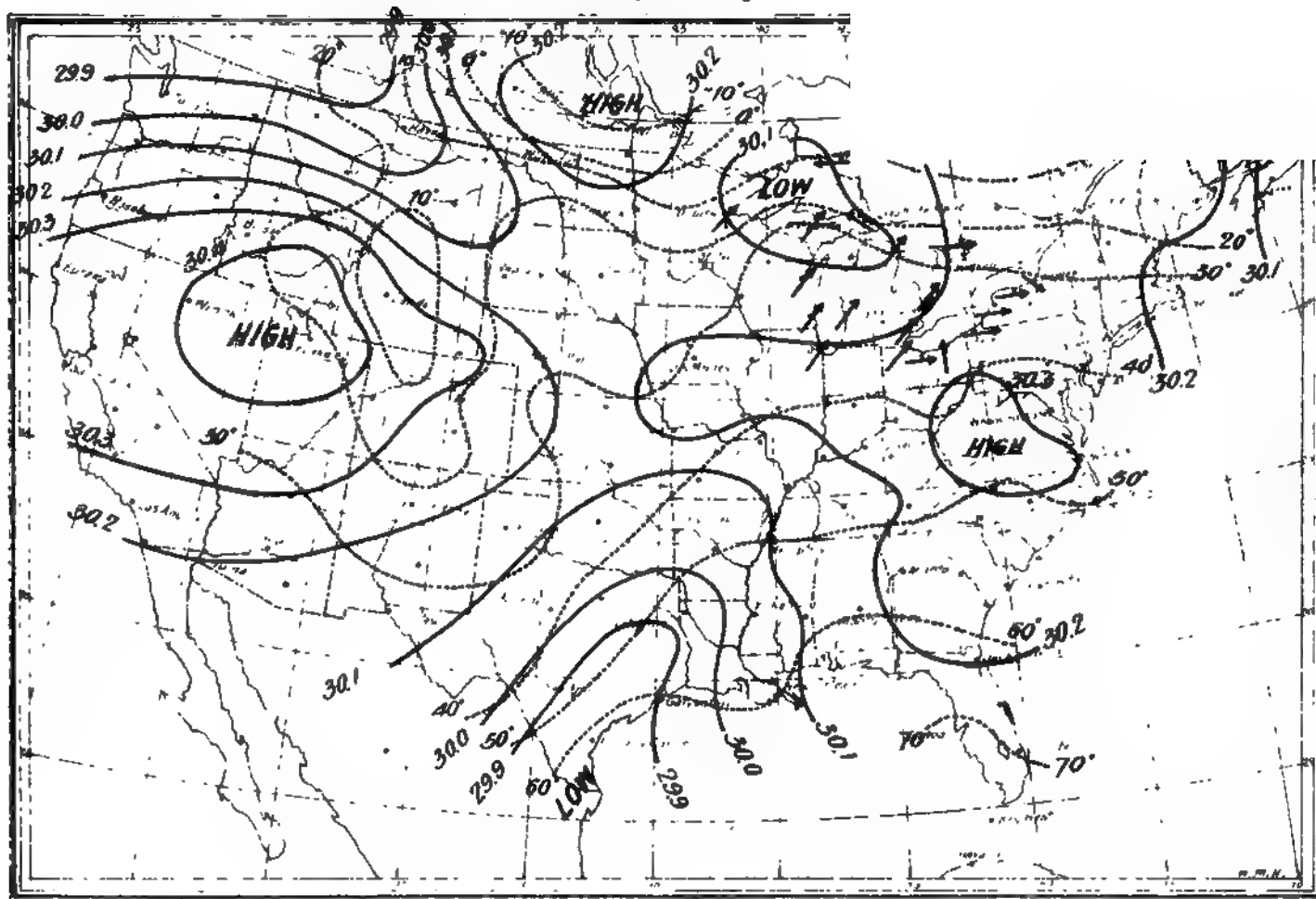


Chart LXVI.

January 22, 1898—8 a. m.

January 22, 1898—8 p. m.

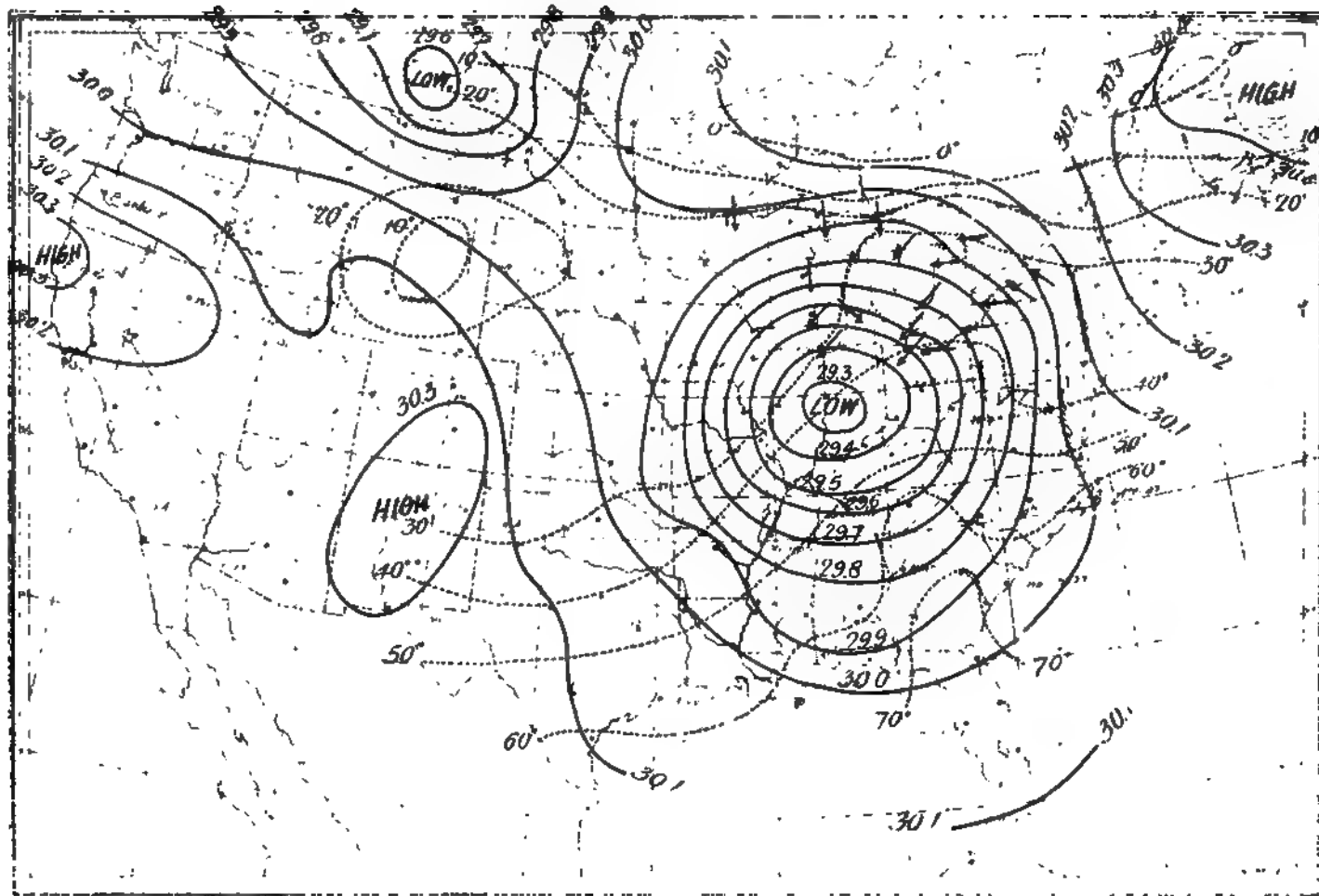
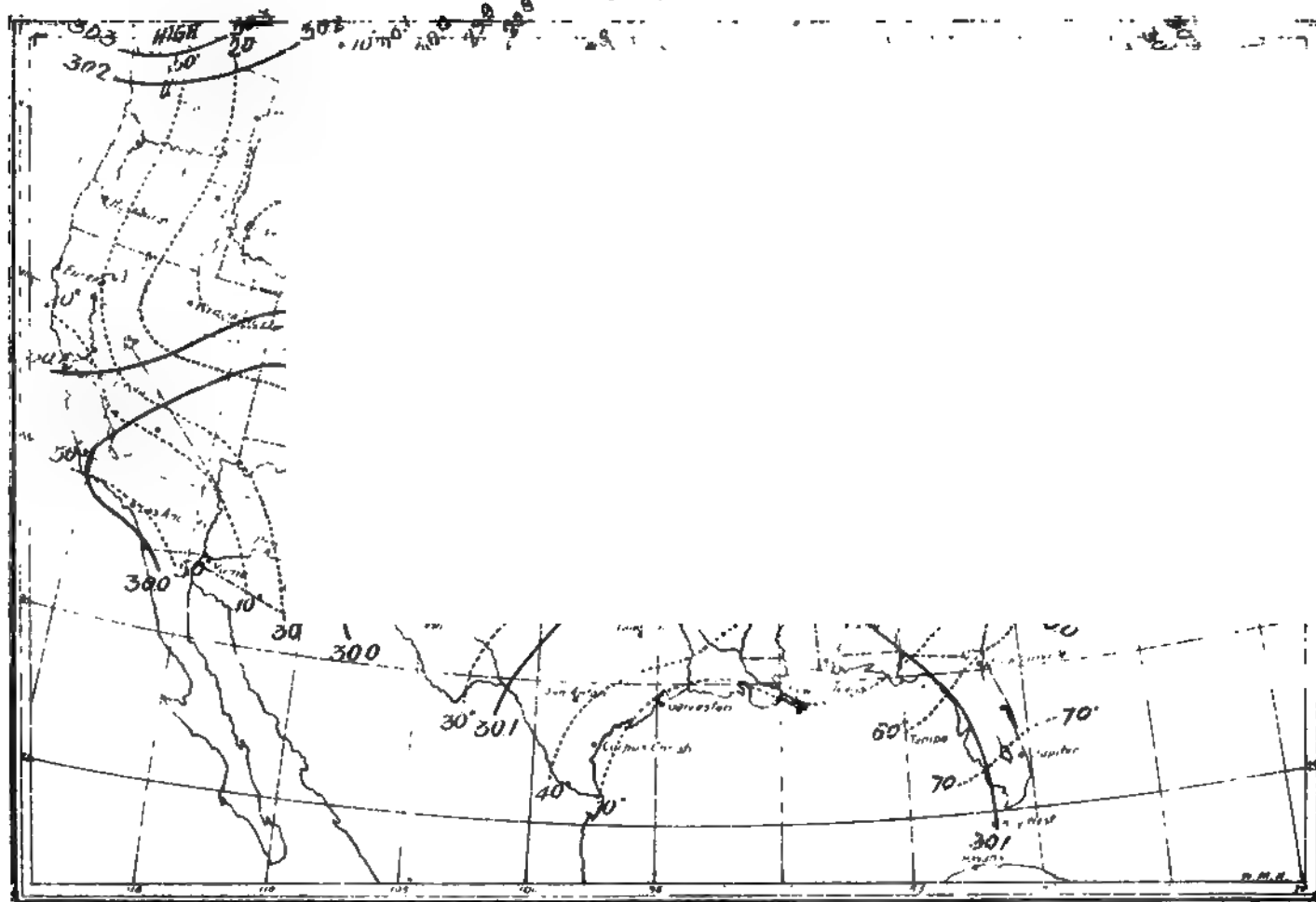


Chart LXVIII.

January 23, 1898—8 a. m.



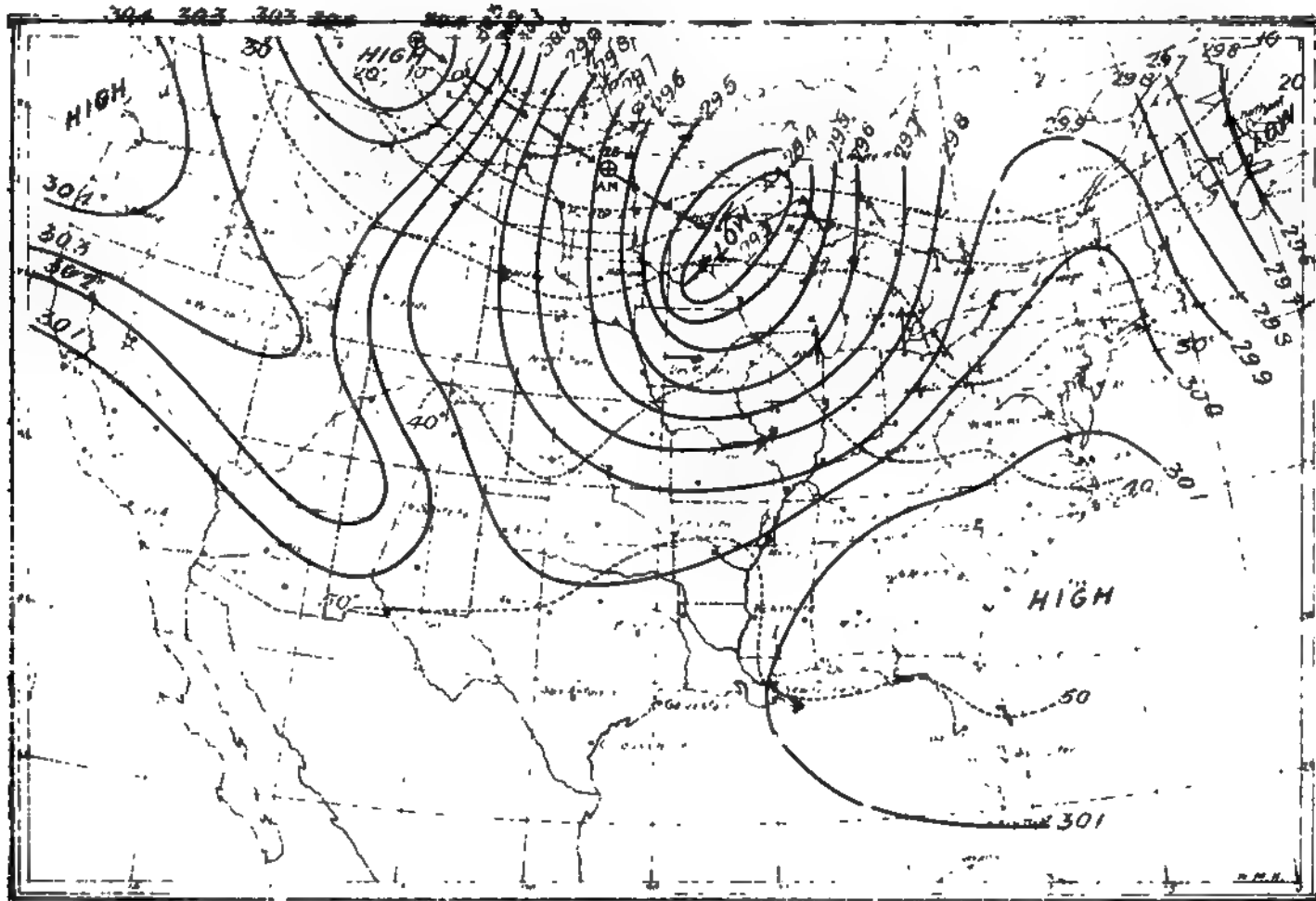
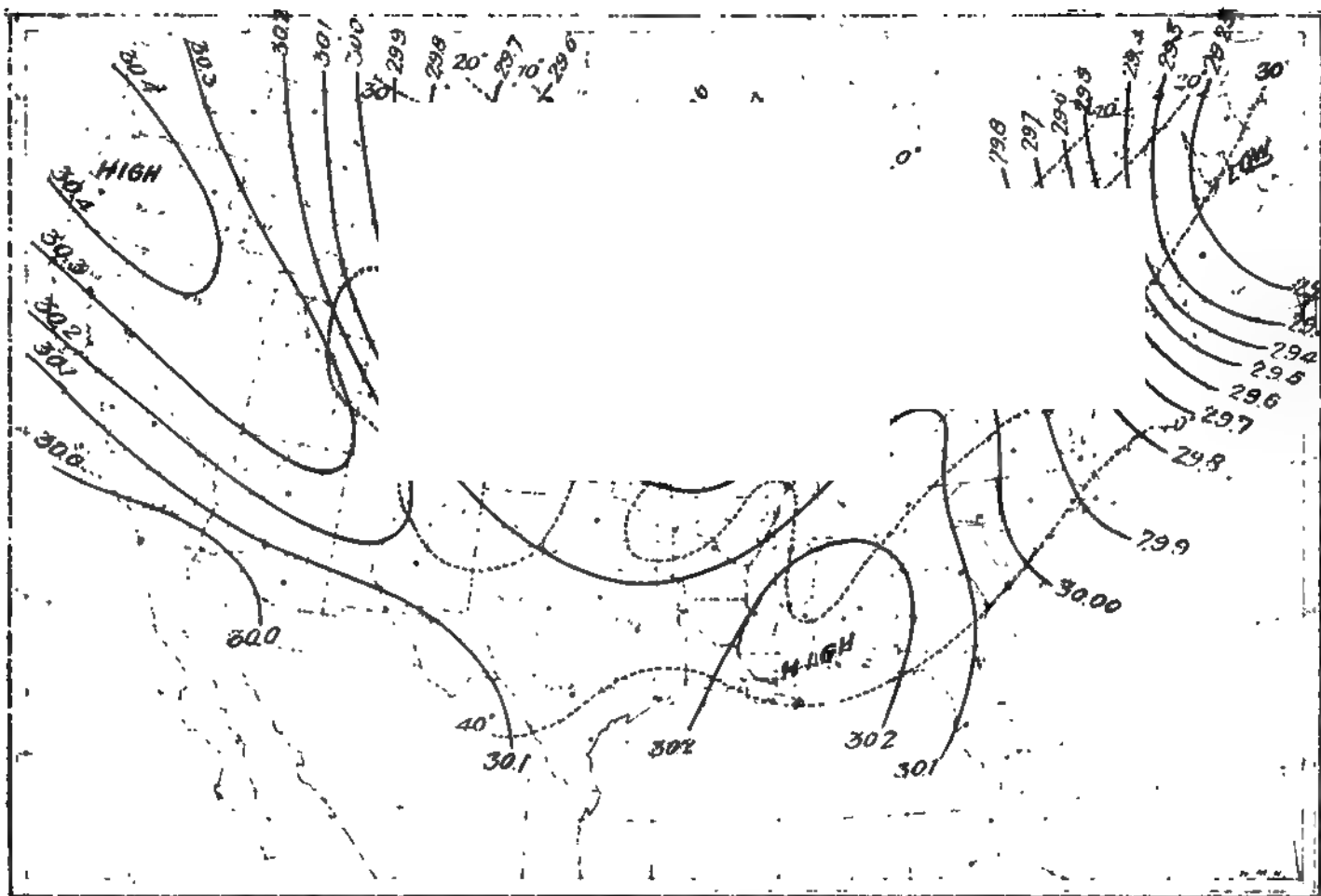


Chart LXXI.

January 26, 1899—8 a. m.

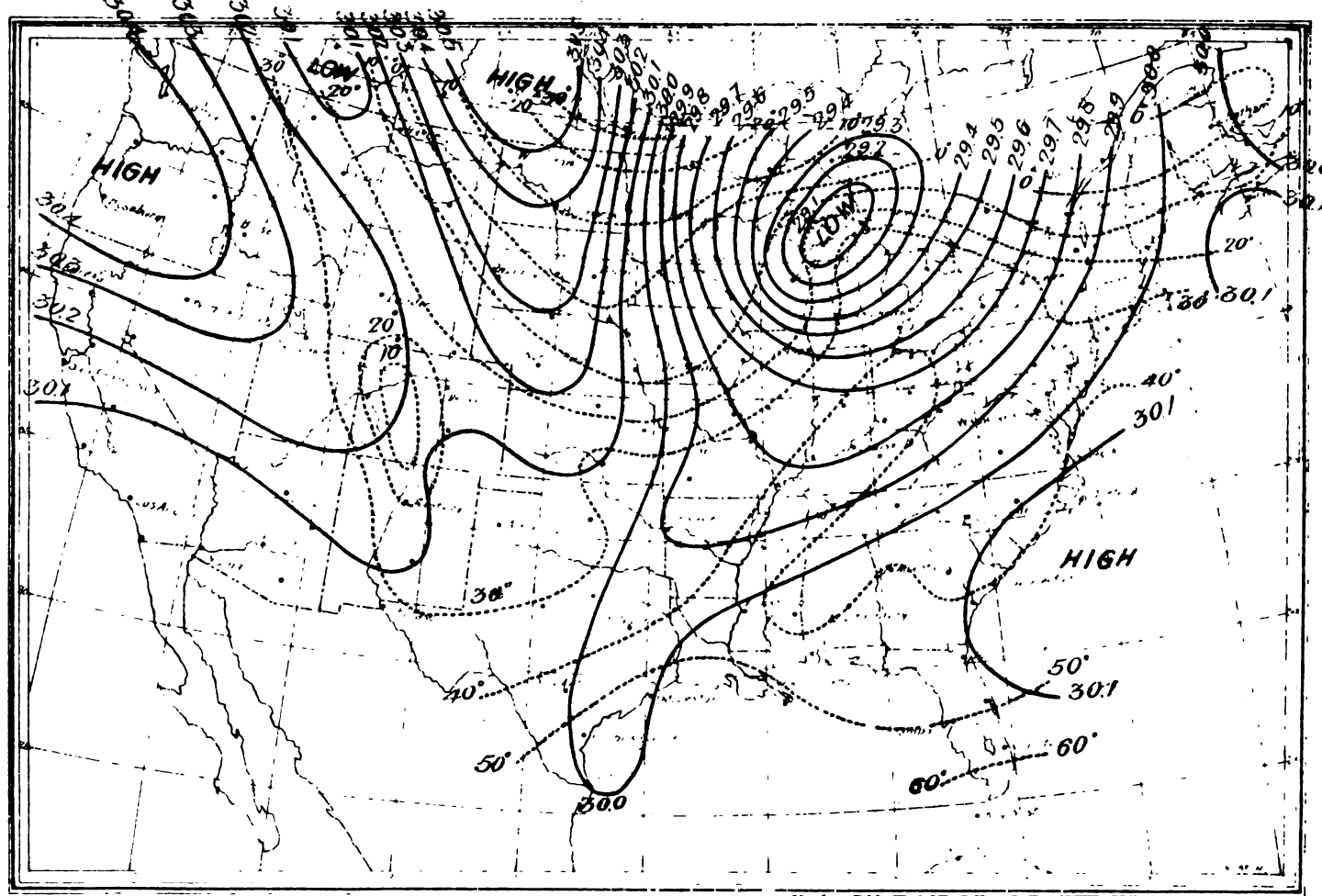
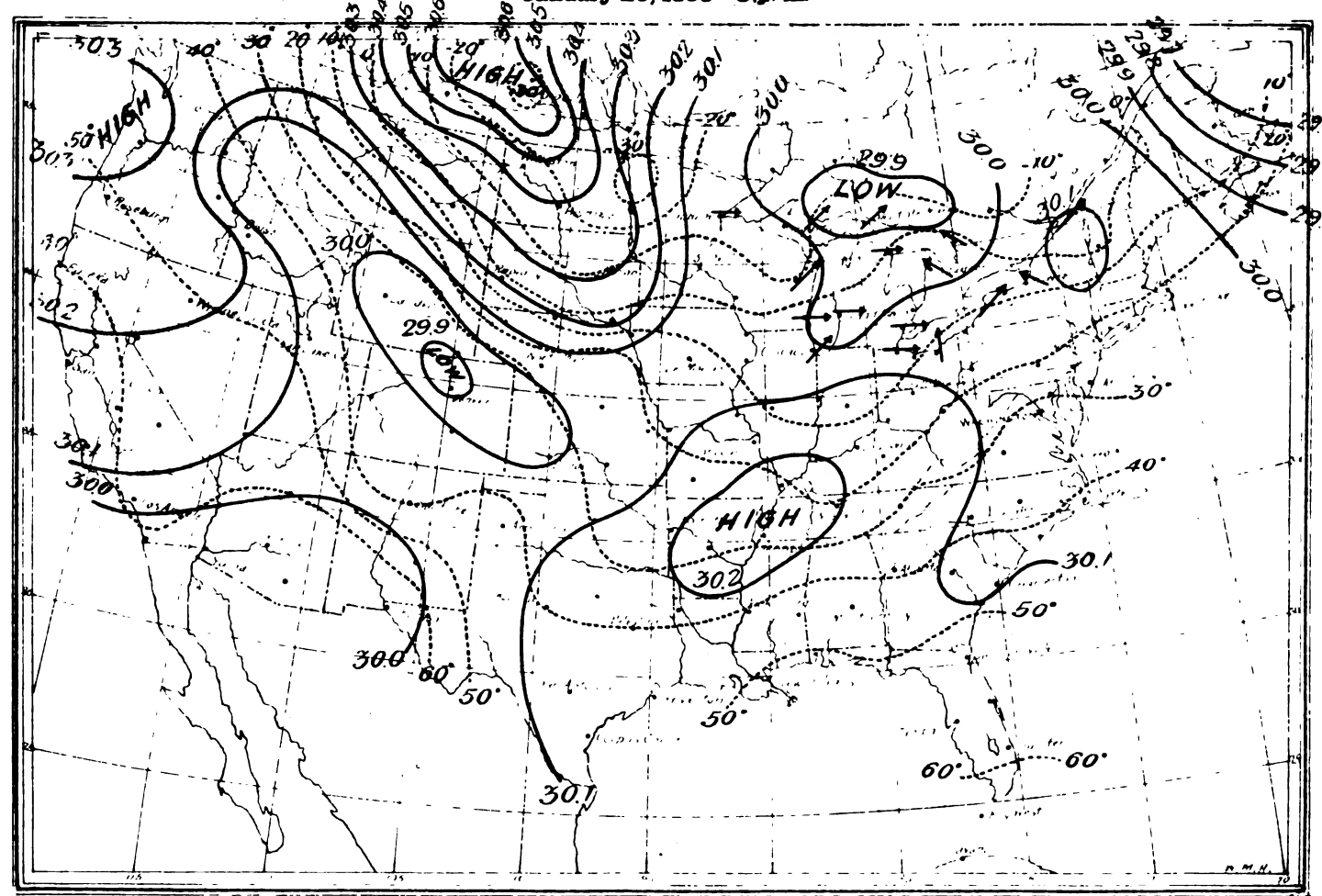


Chart LXXII.

January 26, 1899—8 p. m.



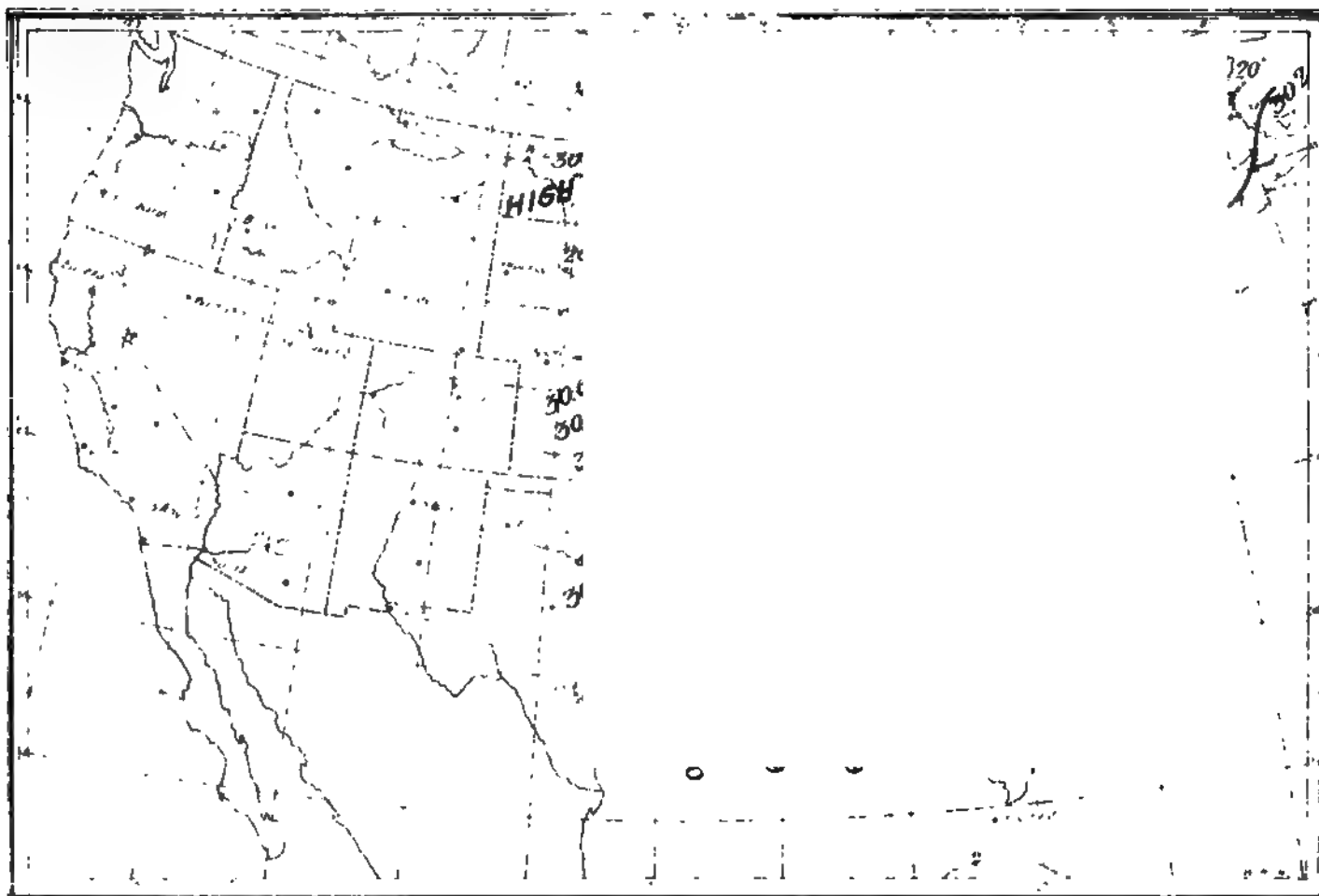
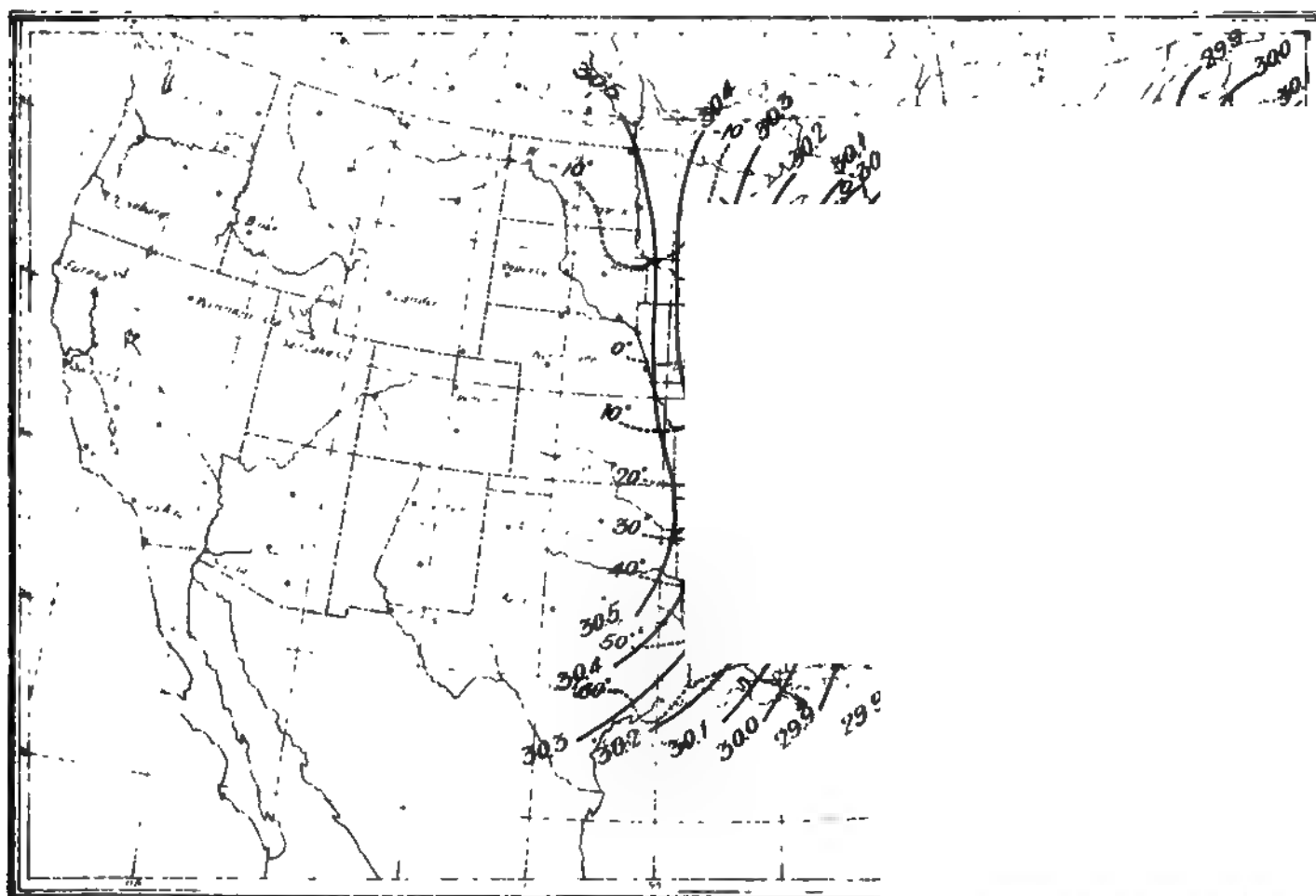
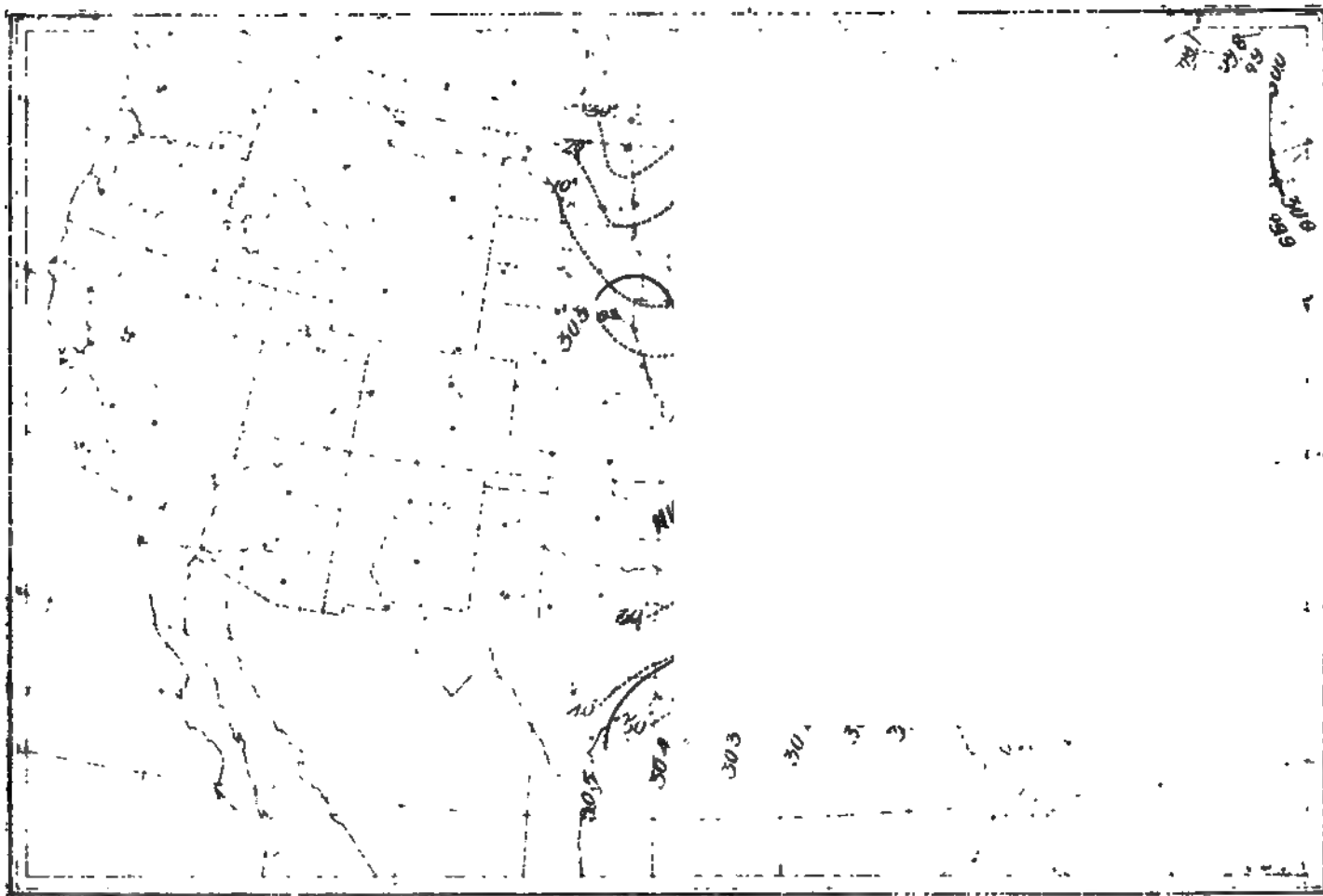


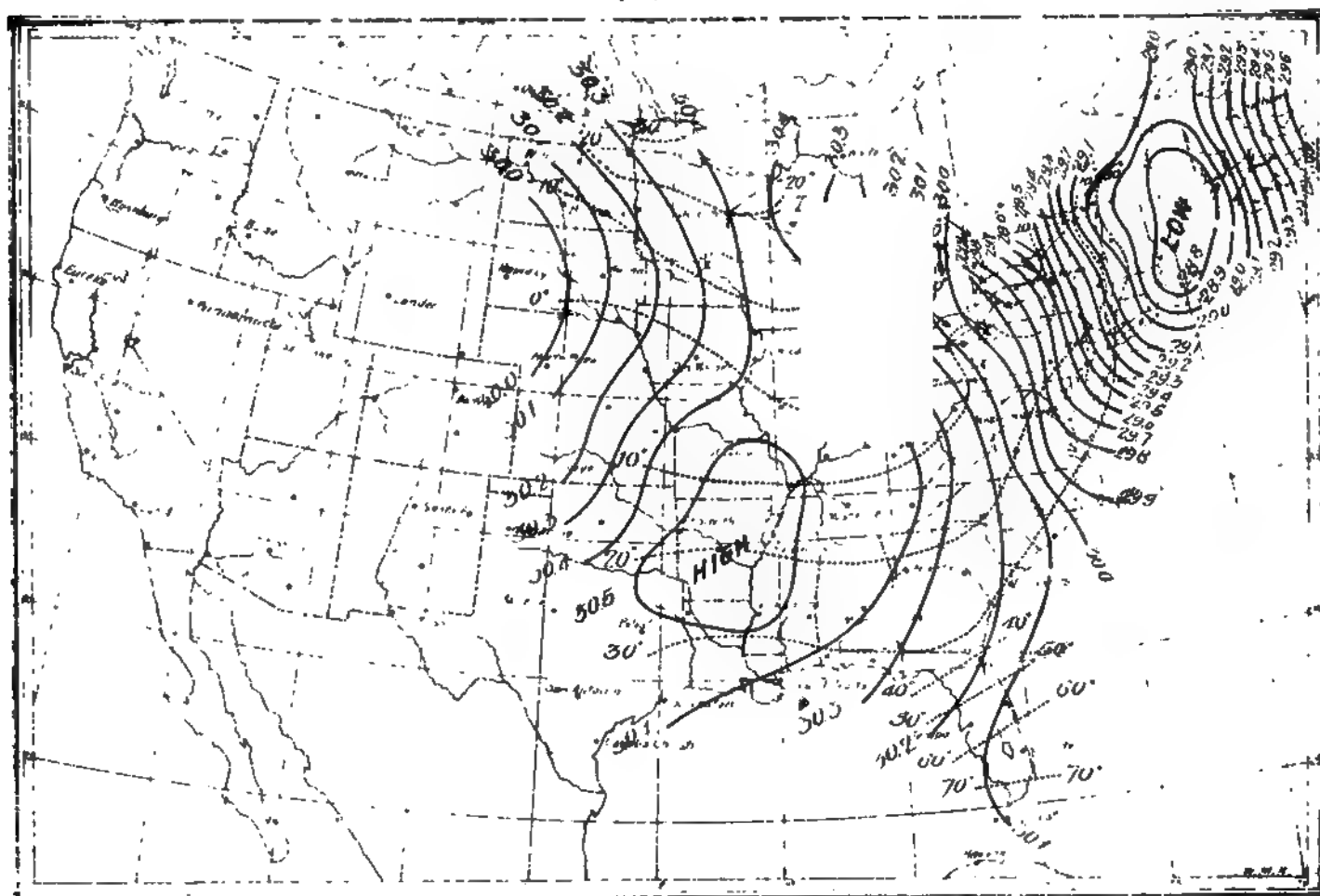
Chart LXXIV.

February 1, 1876—4:35 p. m.





February 2, 1876—7 a. m.



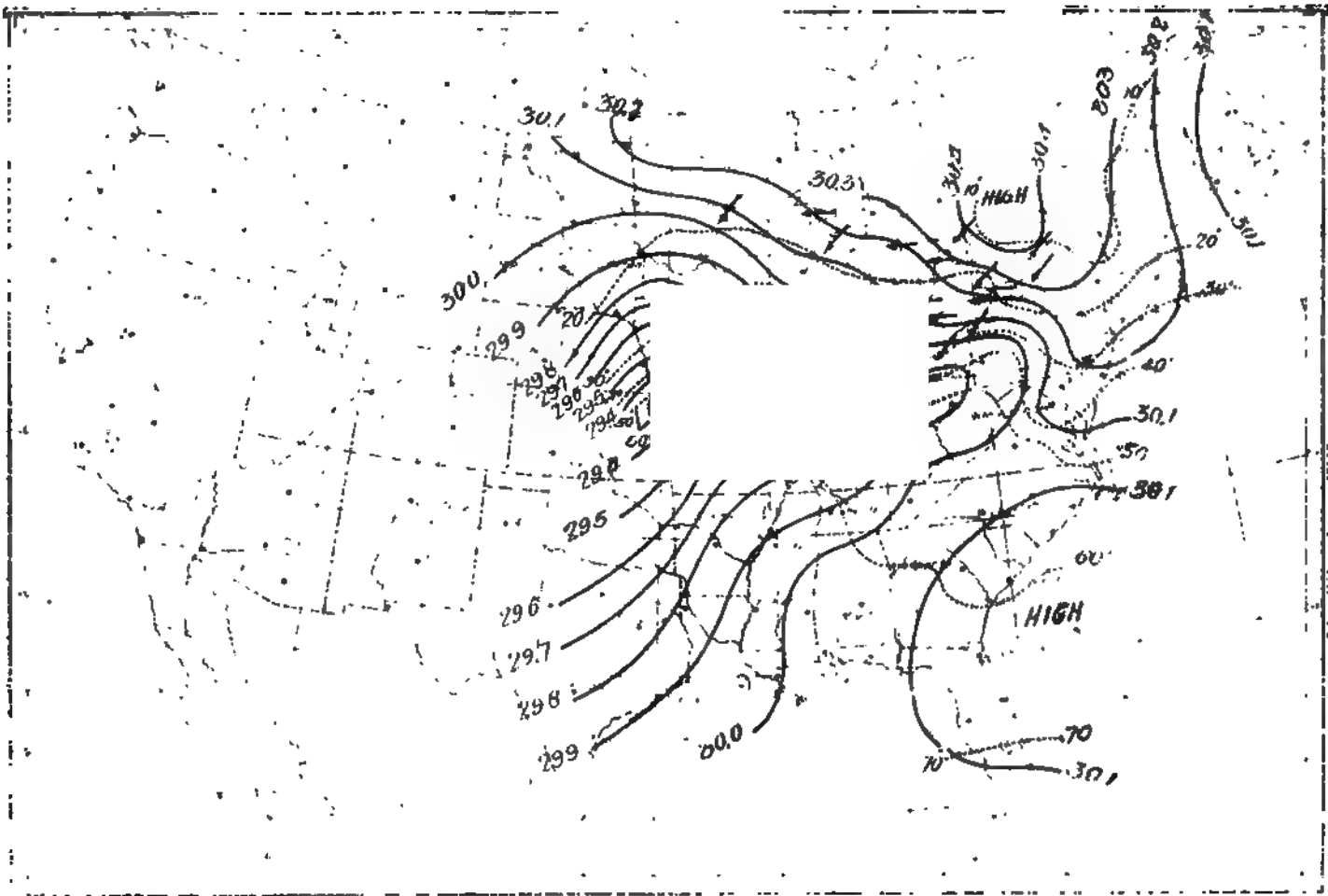
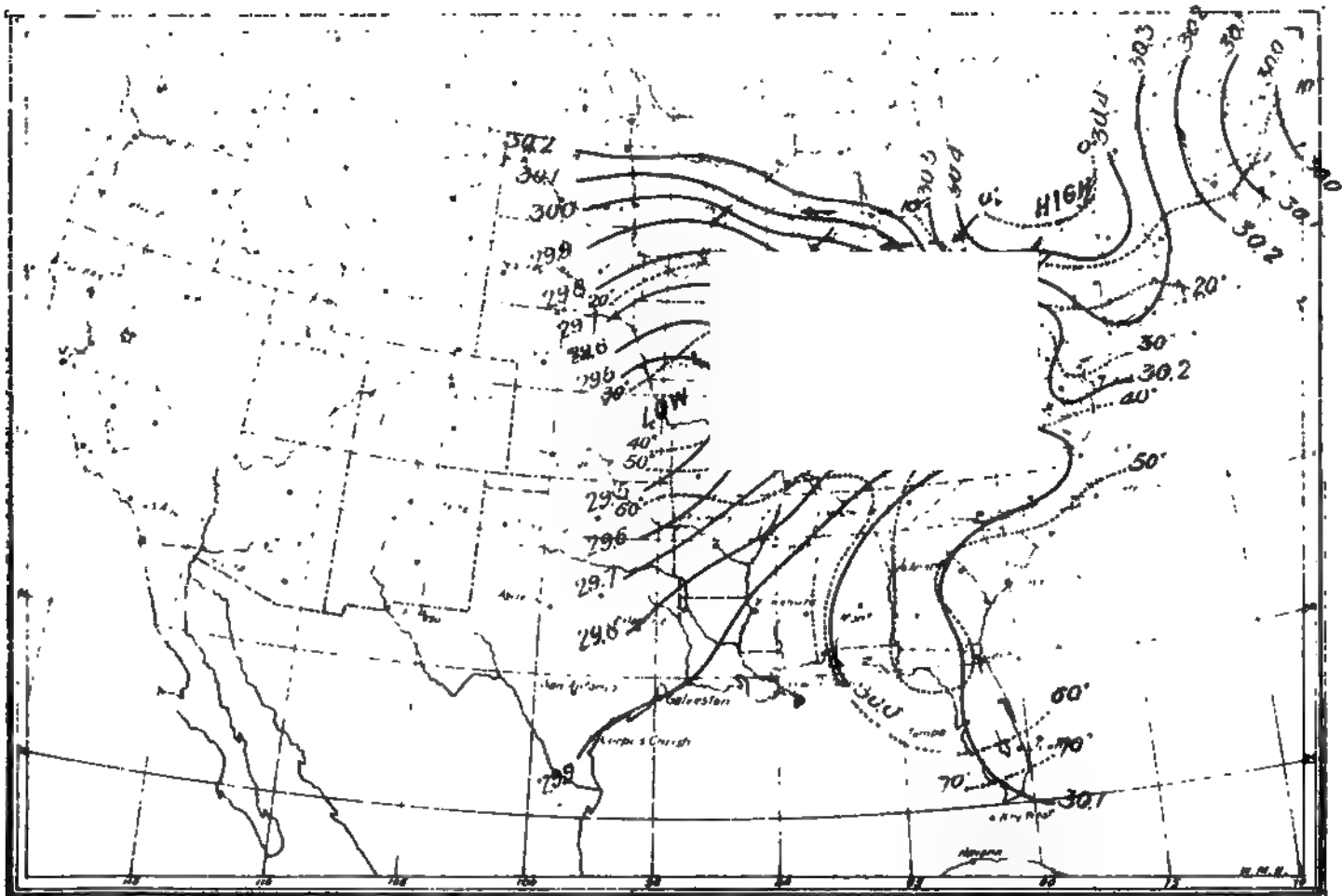
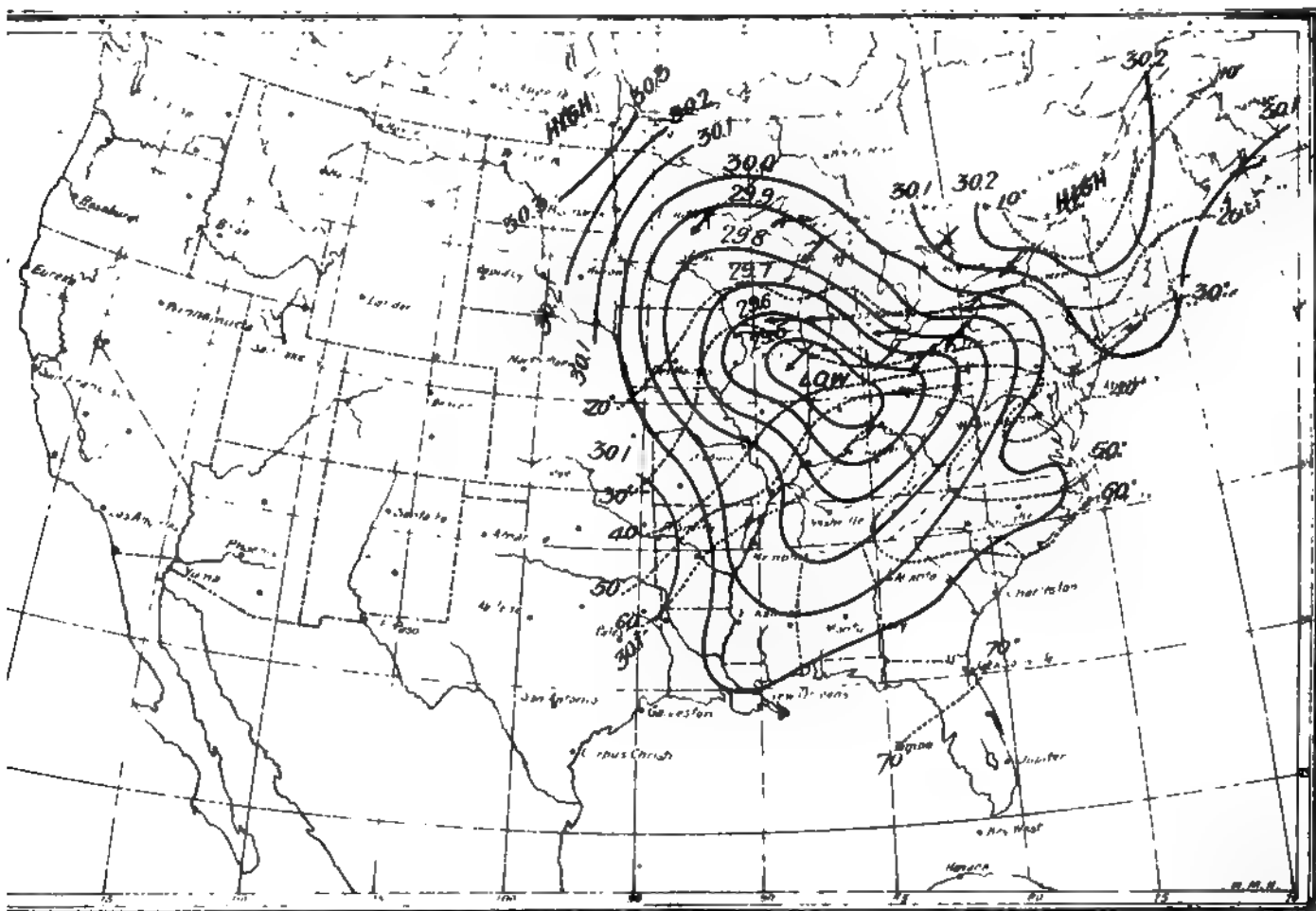
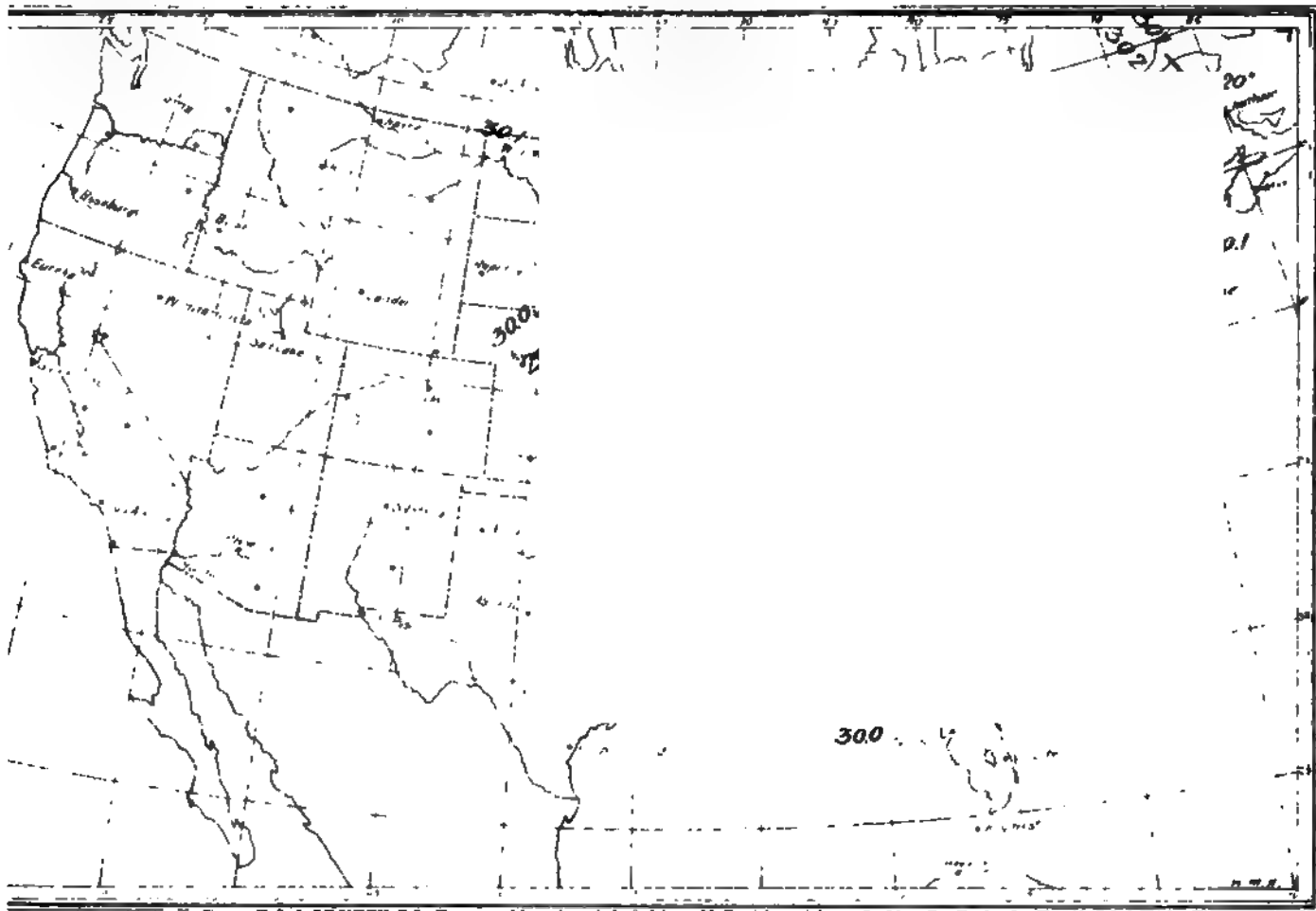


Chart LXXVIII.

February 27, 1876—7:35 a. m.





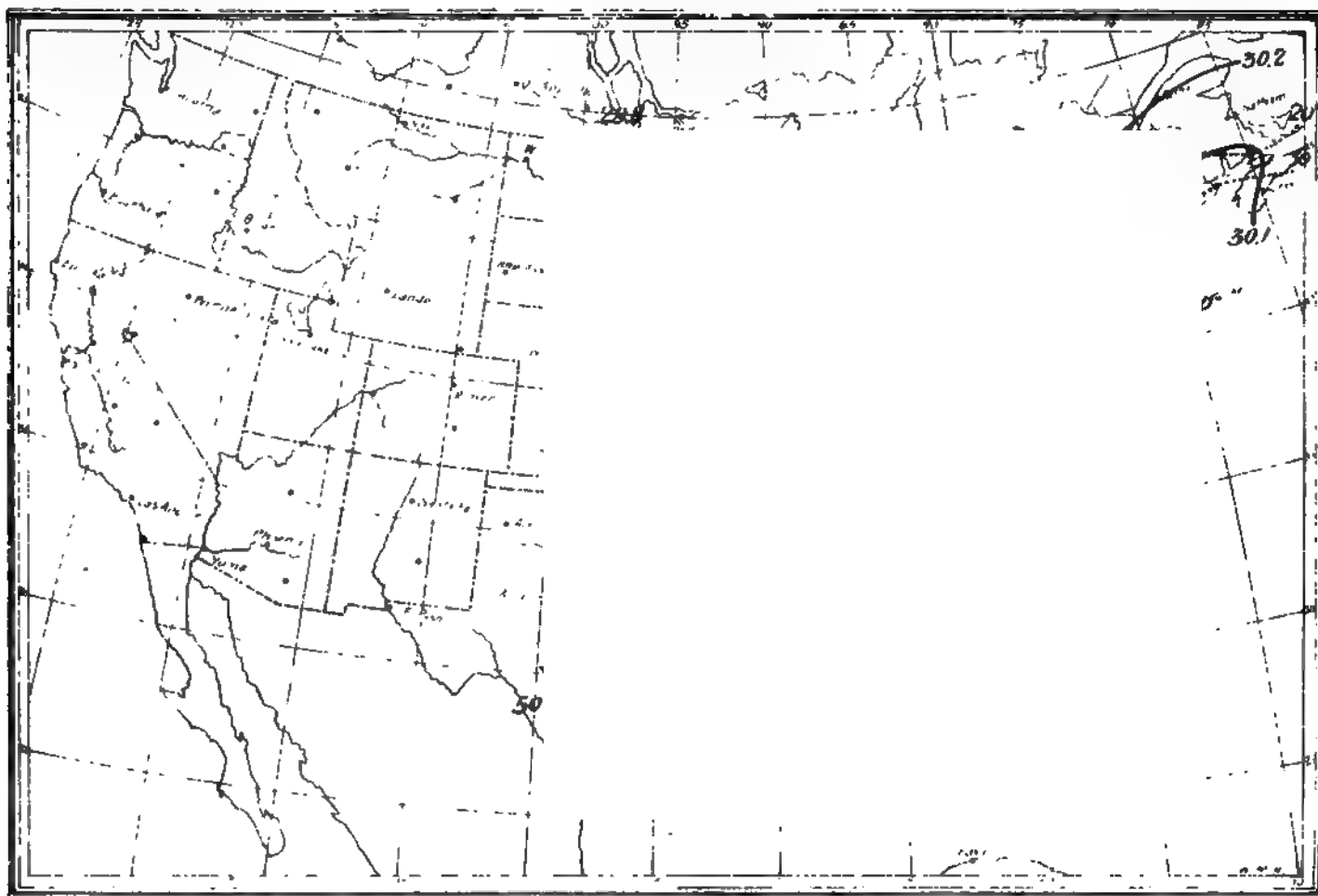


Chart LXXXII.

February 21, 1878—4:35 p. m.

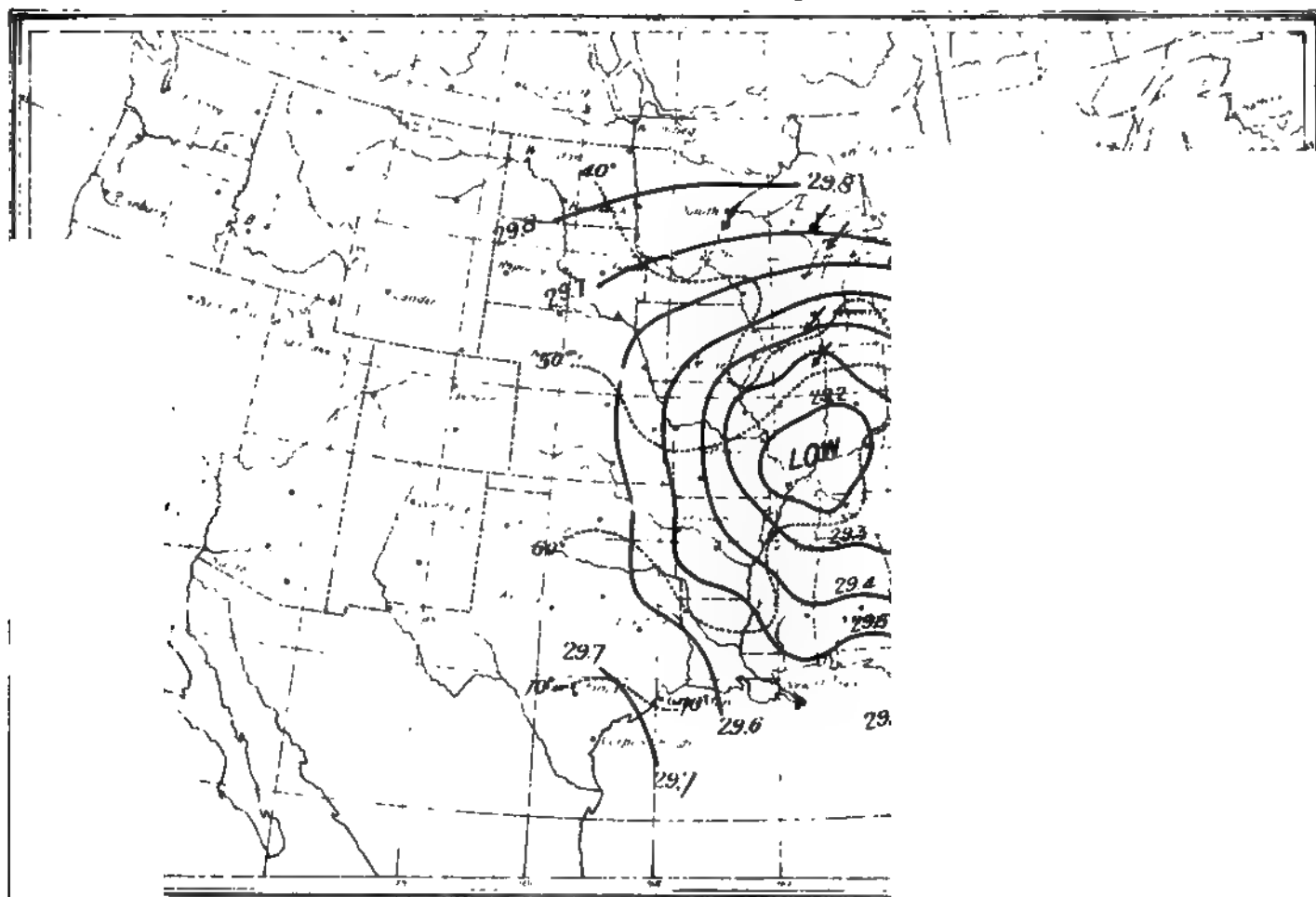


Chart LXXXIII.

February 21, 1878—11 p. m.

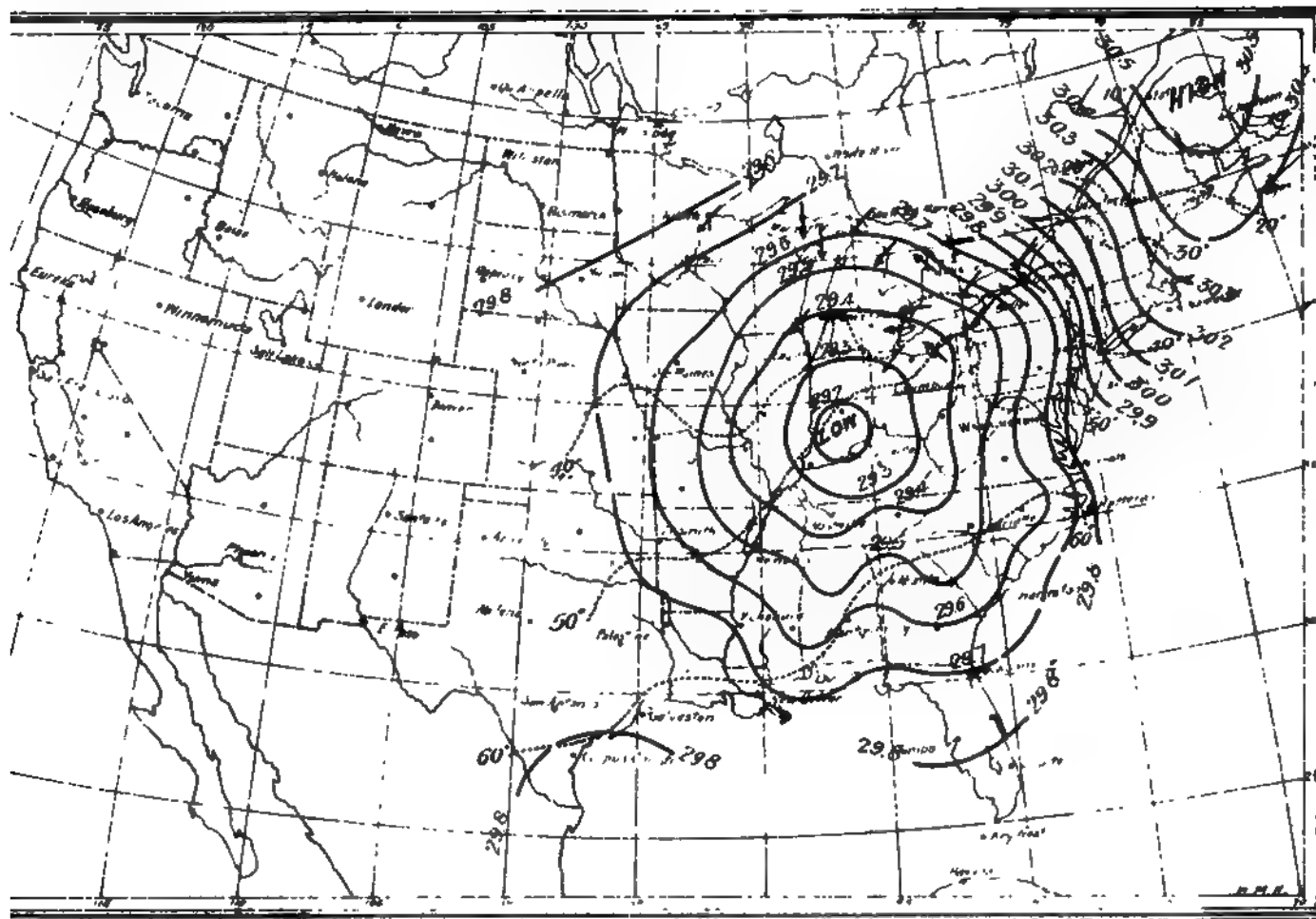


Chart LXXXIV.

February 22, 1878—7:35 a. m.

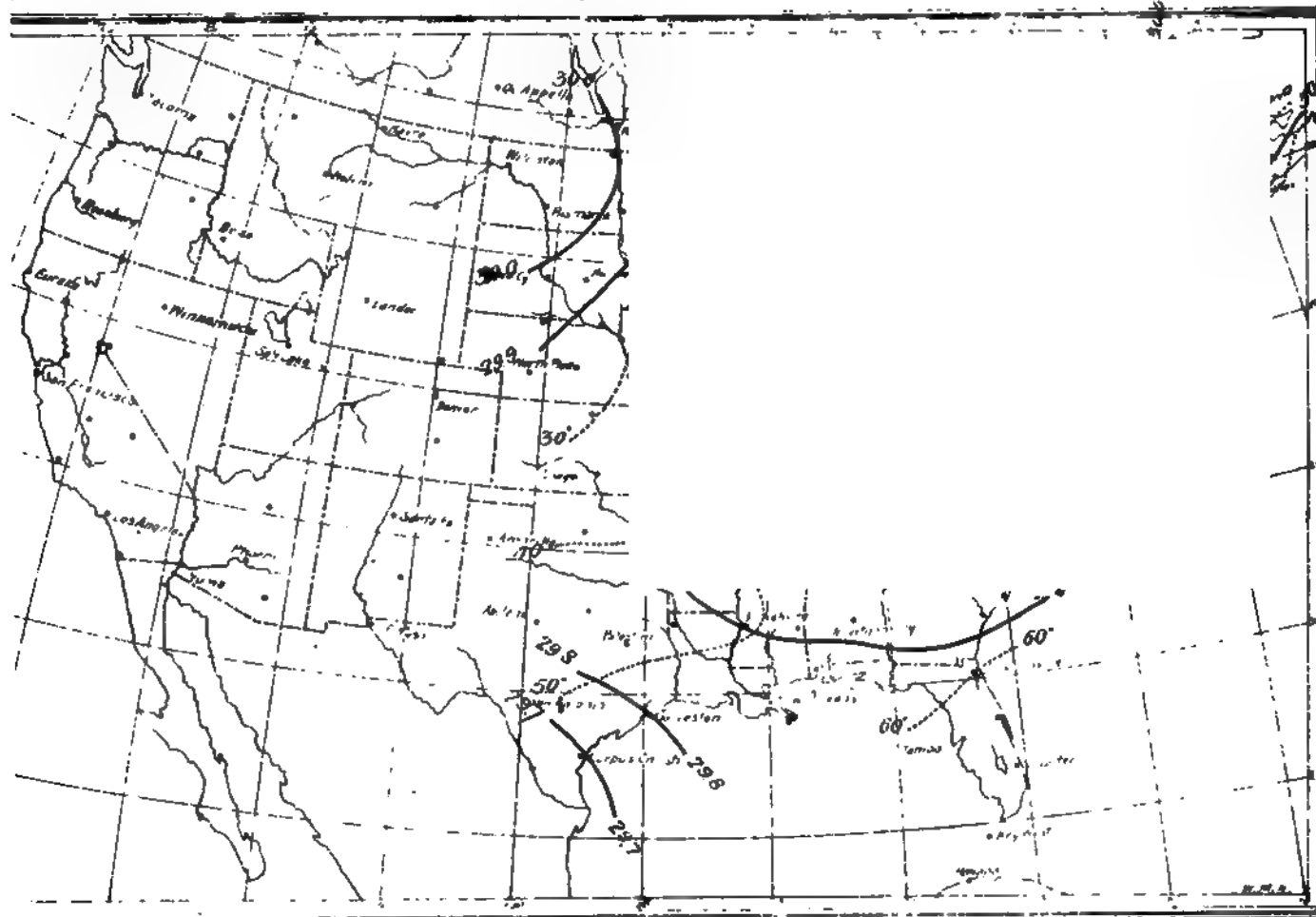


Chart LXXXV.

February 11, 1880—7 a. m.

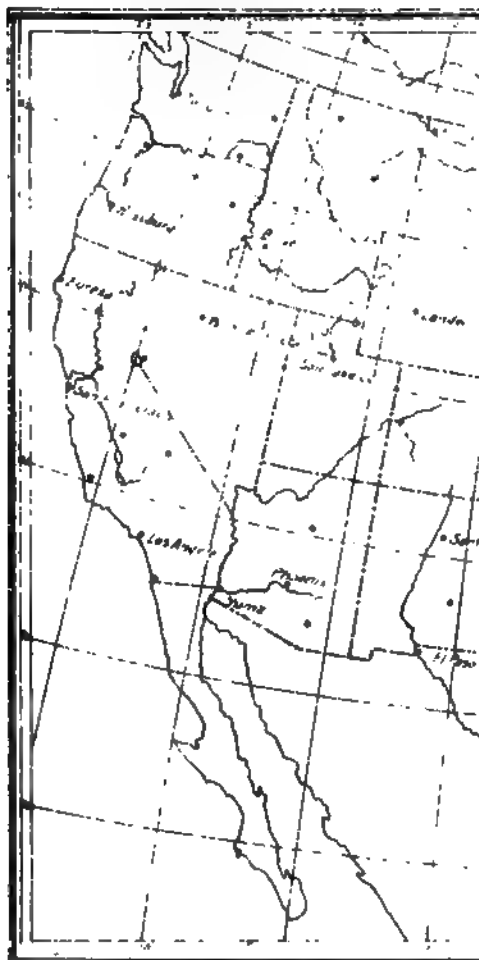
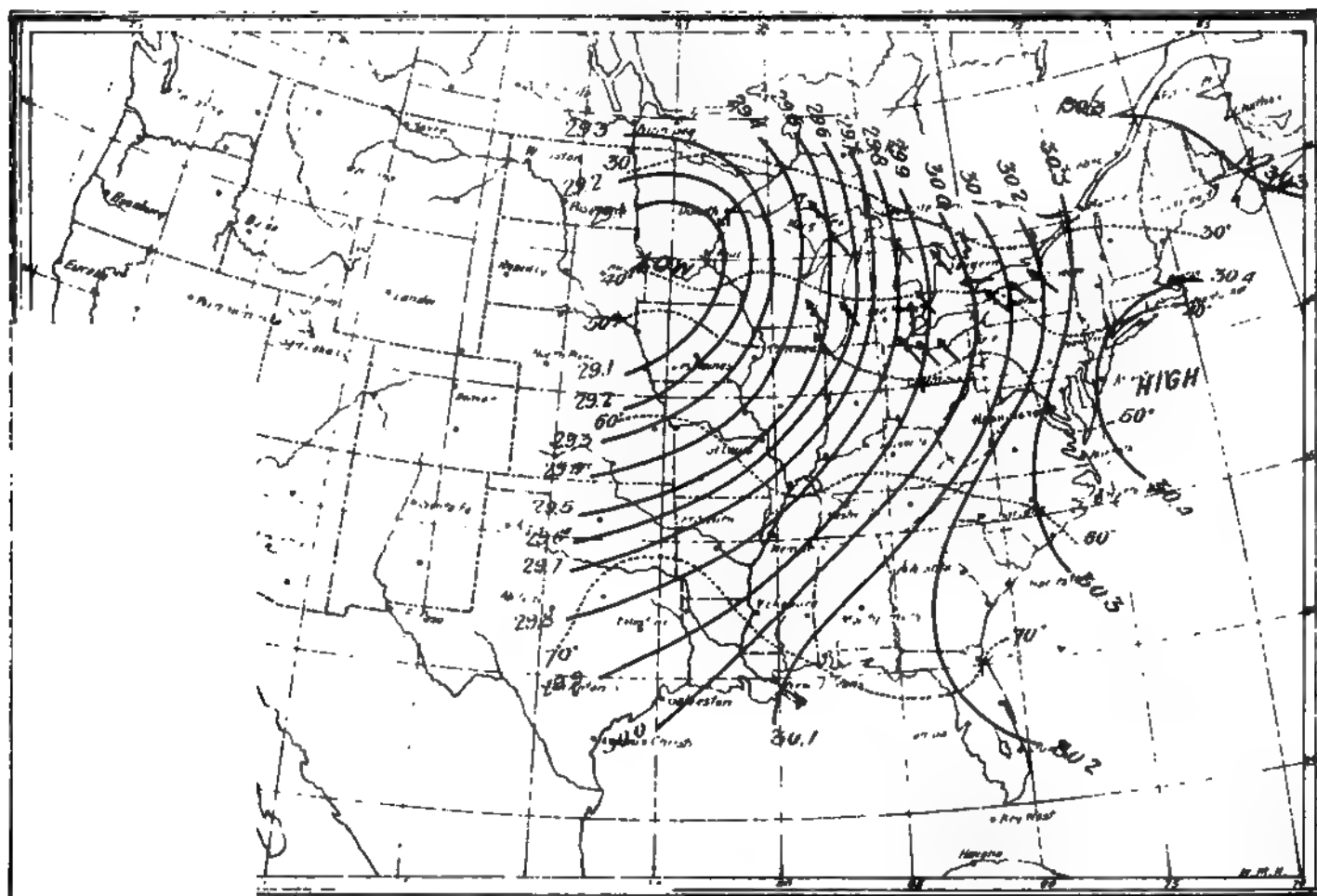


Chart LXXXVI.

February 11, 1880—3 p. m.



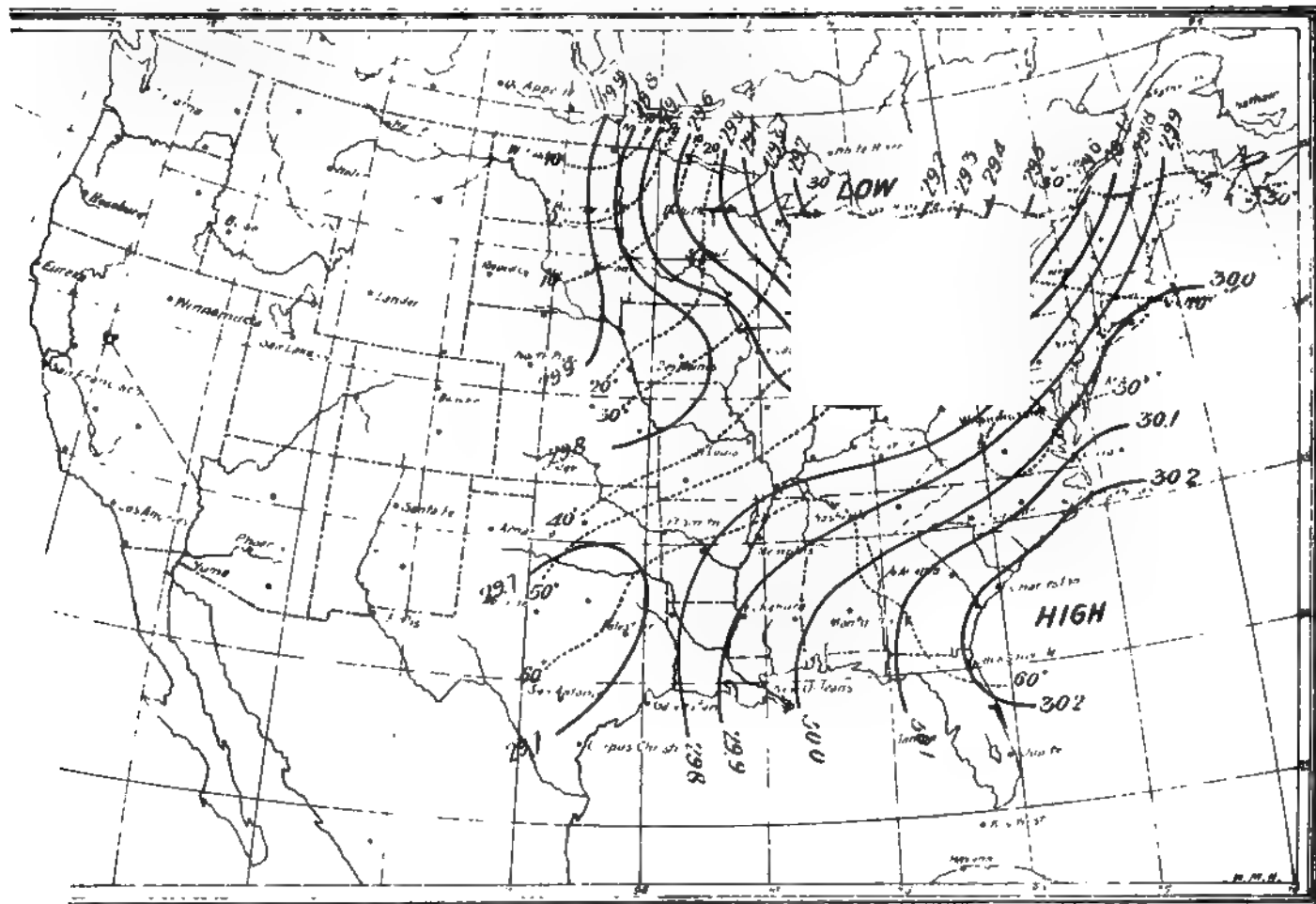
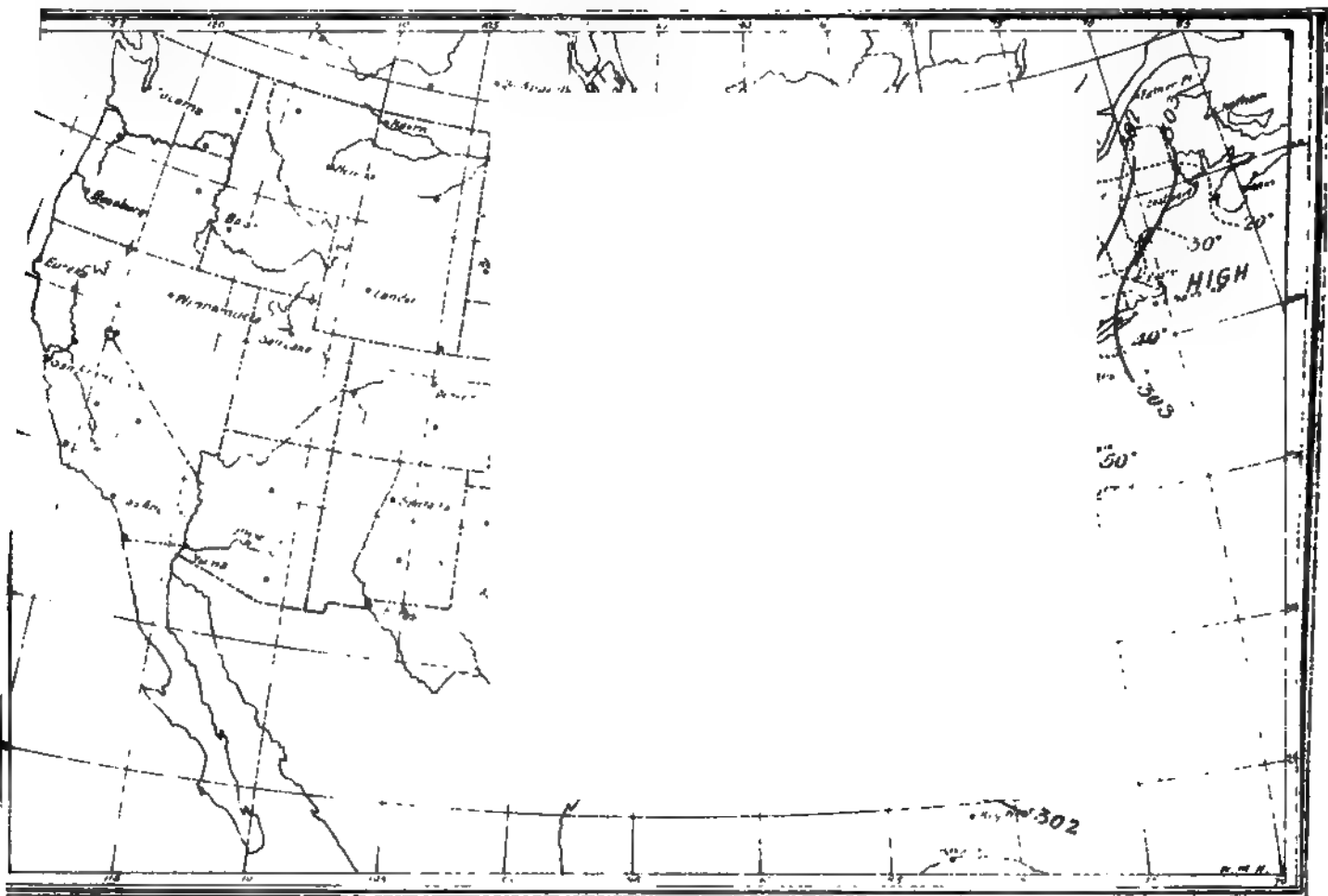


Chart LXXXIX.

February 9, 1881—7 a. m.

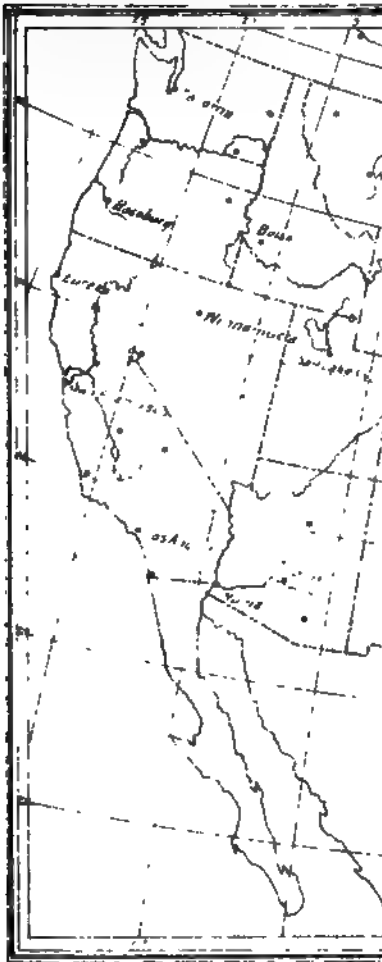


Chart XC.

February 9, 1881—3 p. m.

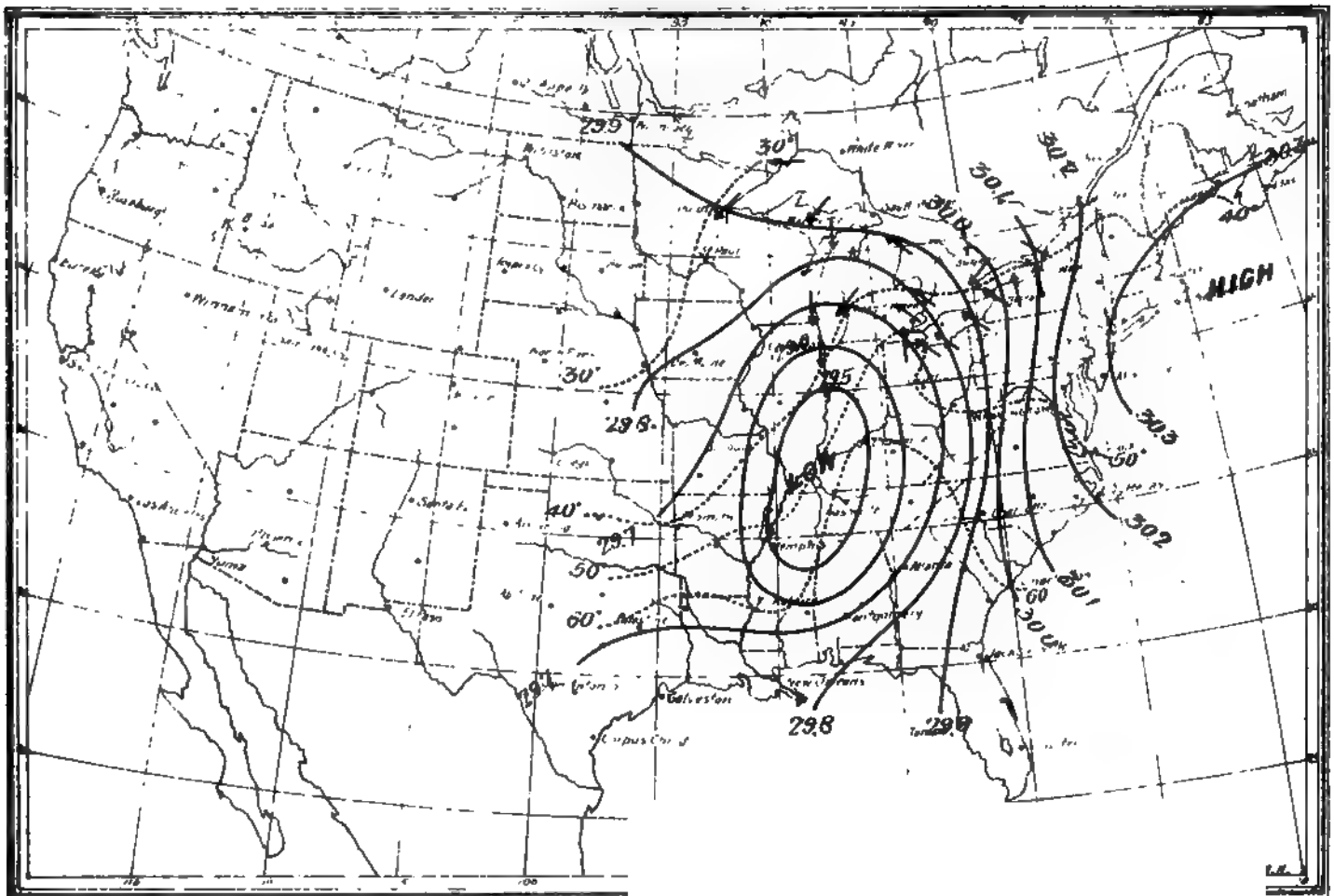


Chart XCI.

February 9, 1881—11 p. m.

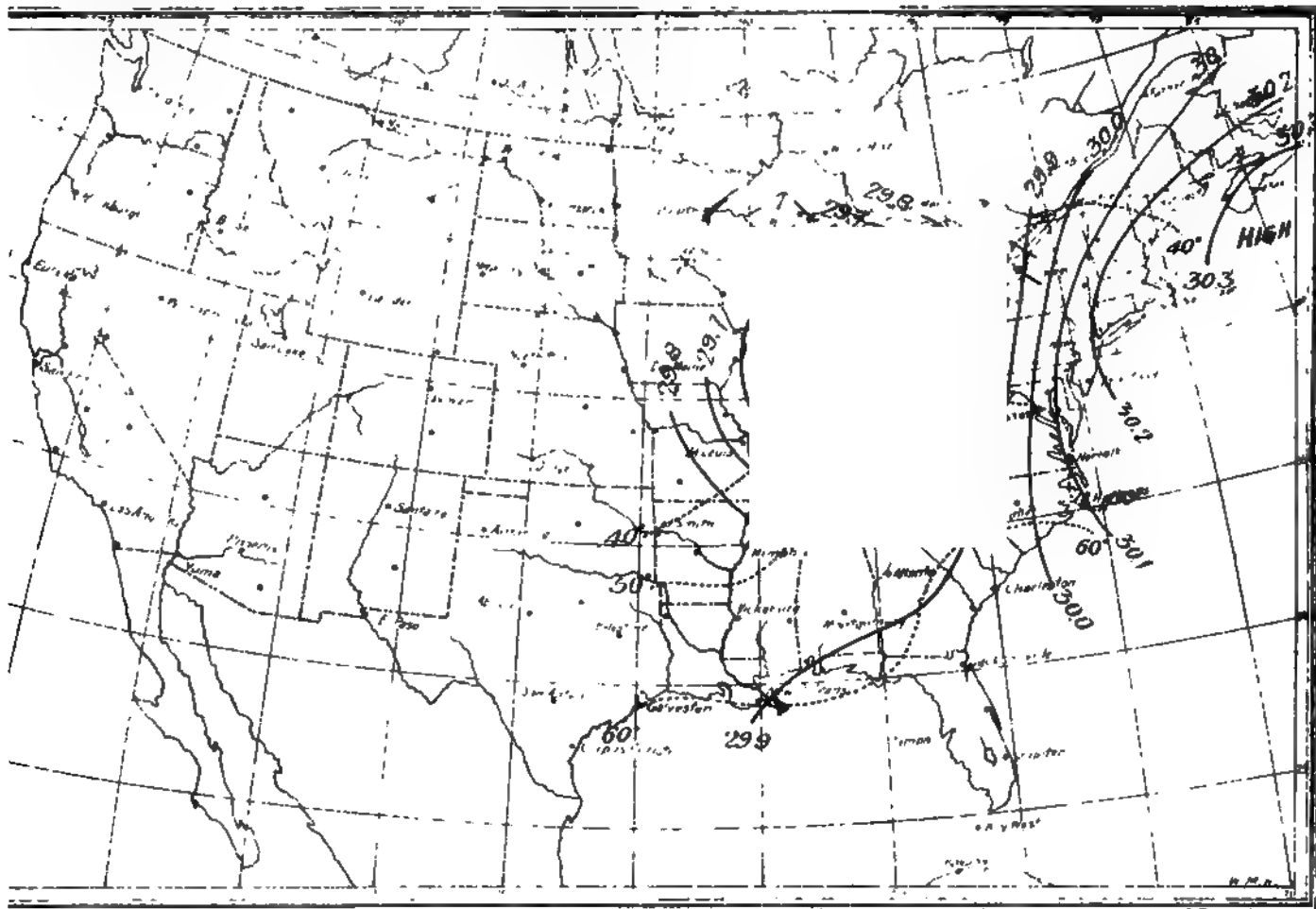


Chart XCII.

February 10, 1881—7 a. m.

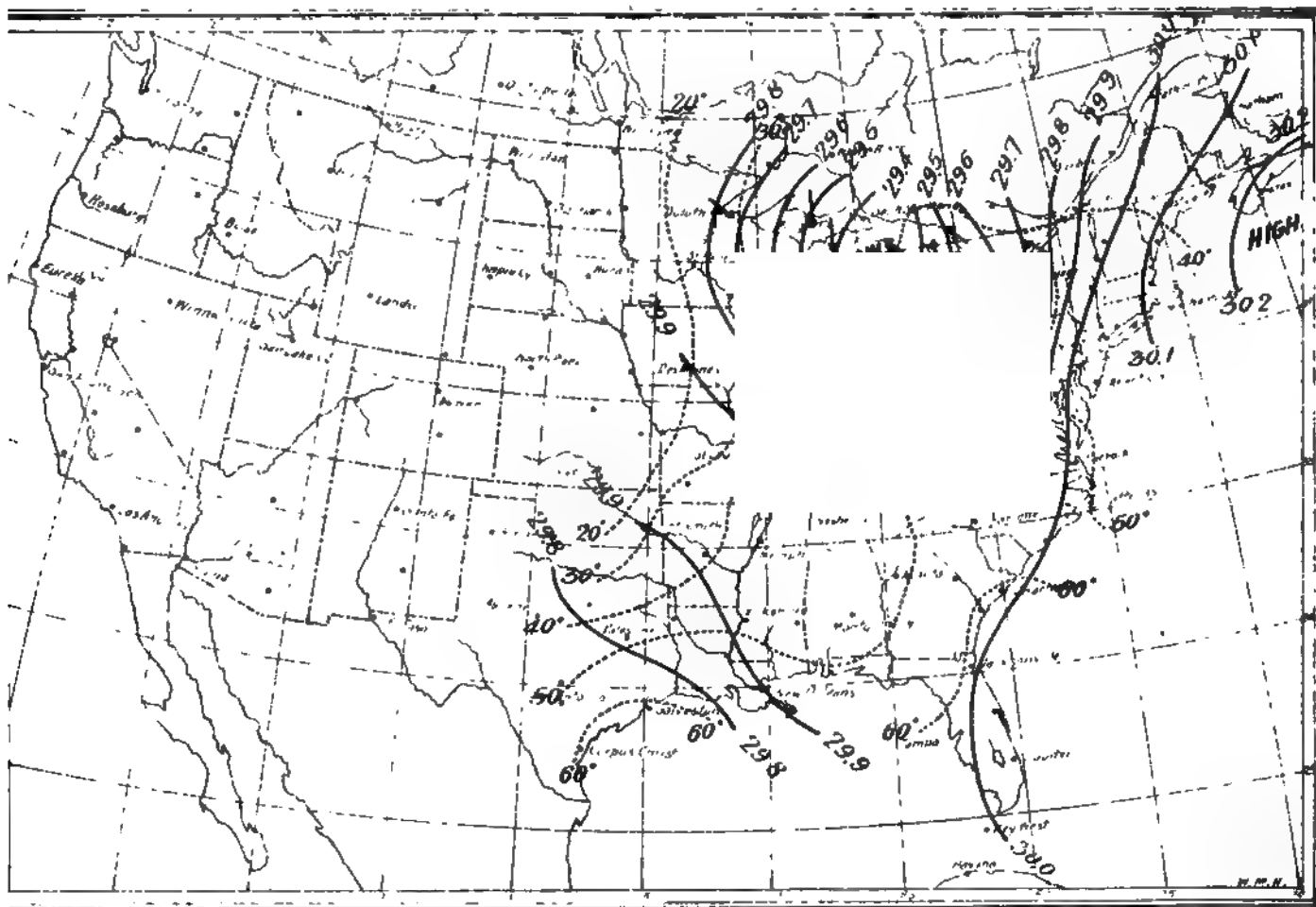


Chart XCH.

February 11, 1881—7 a. m.

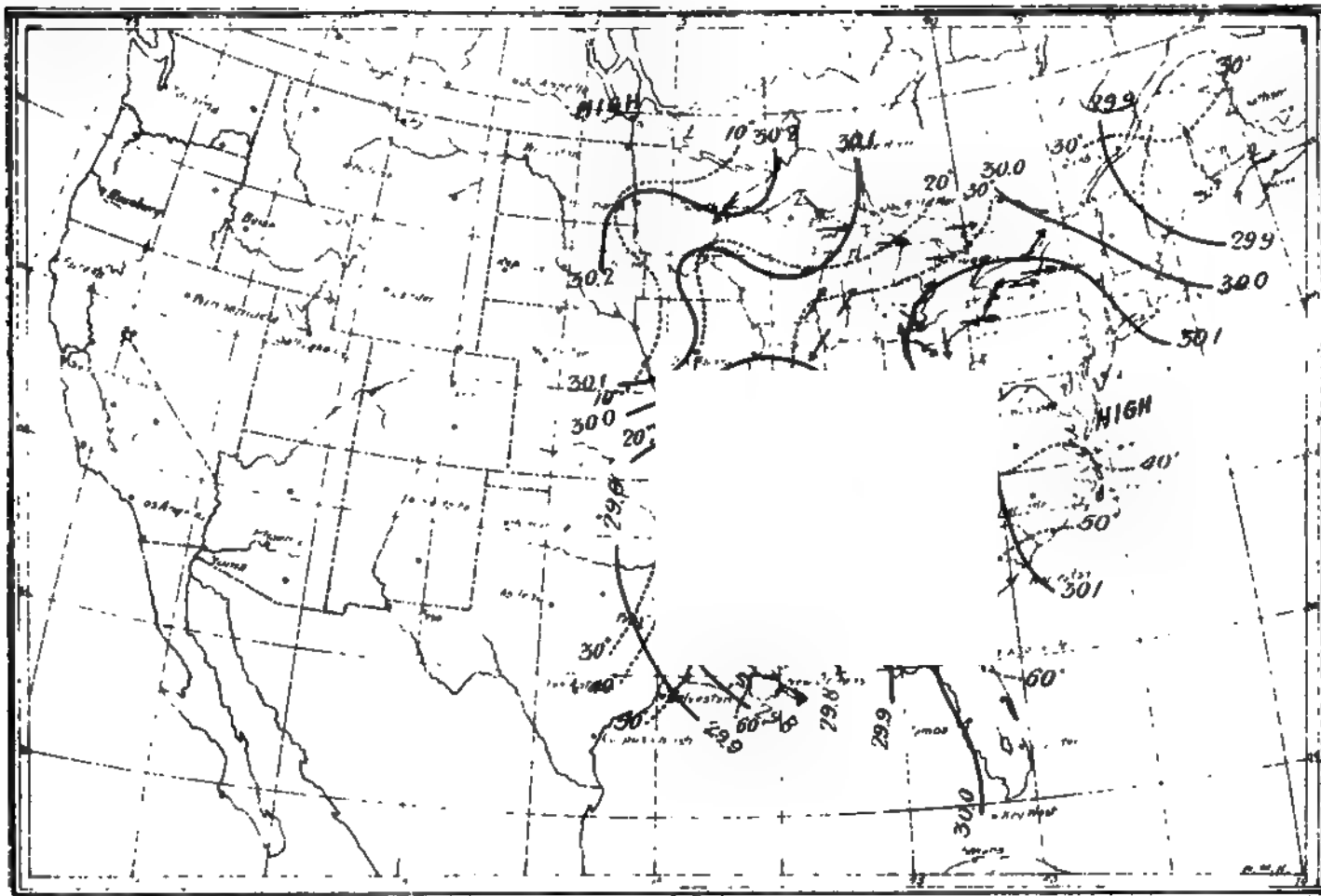


Chart XOIV.

February 11, 1881—8 p. m.



Chart XOV.

February 11, 1881—11 p. m.

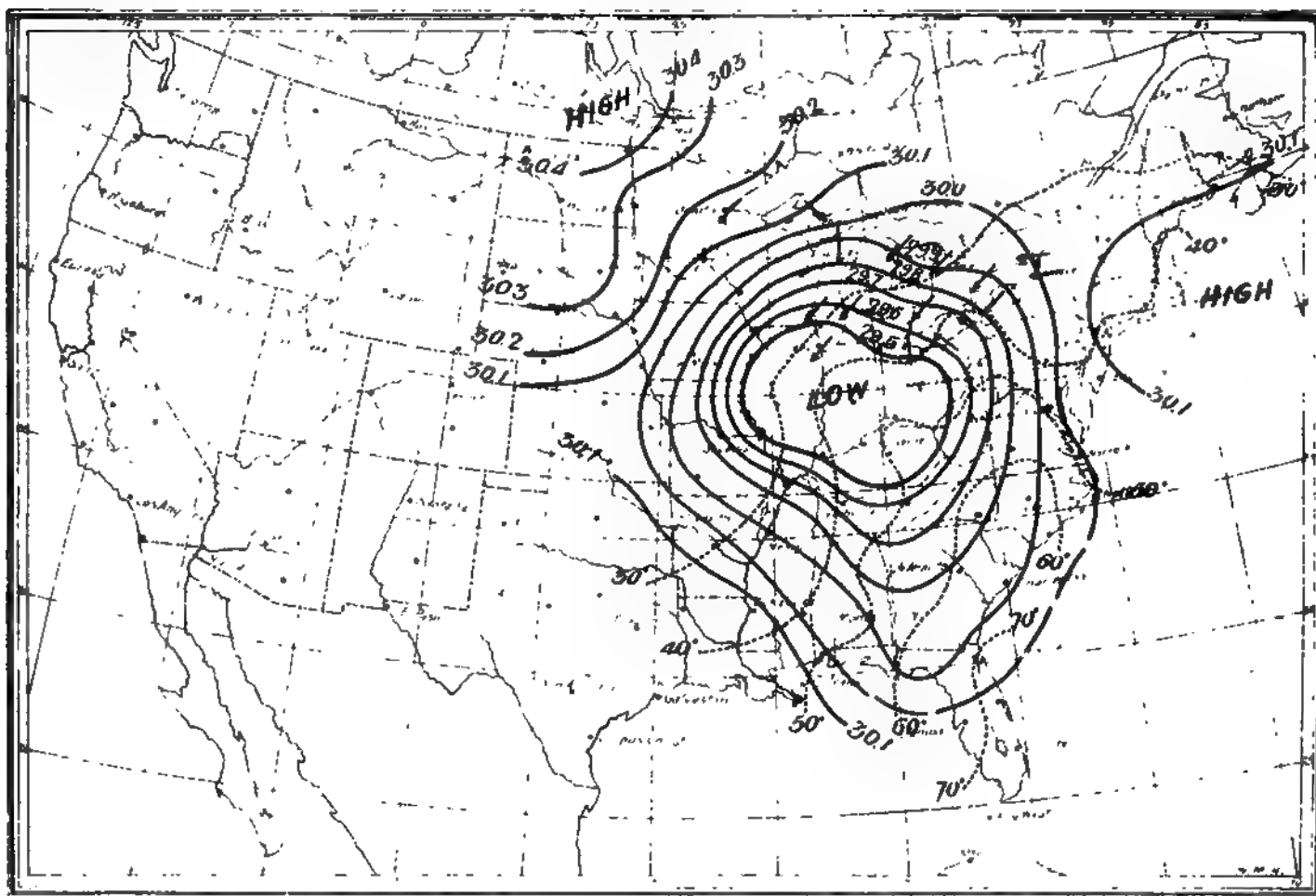


Chart XOV.

February 12, 1881—7 a. m.

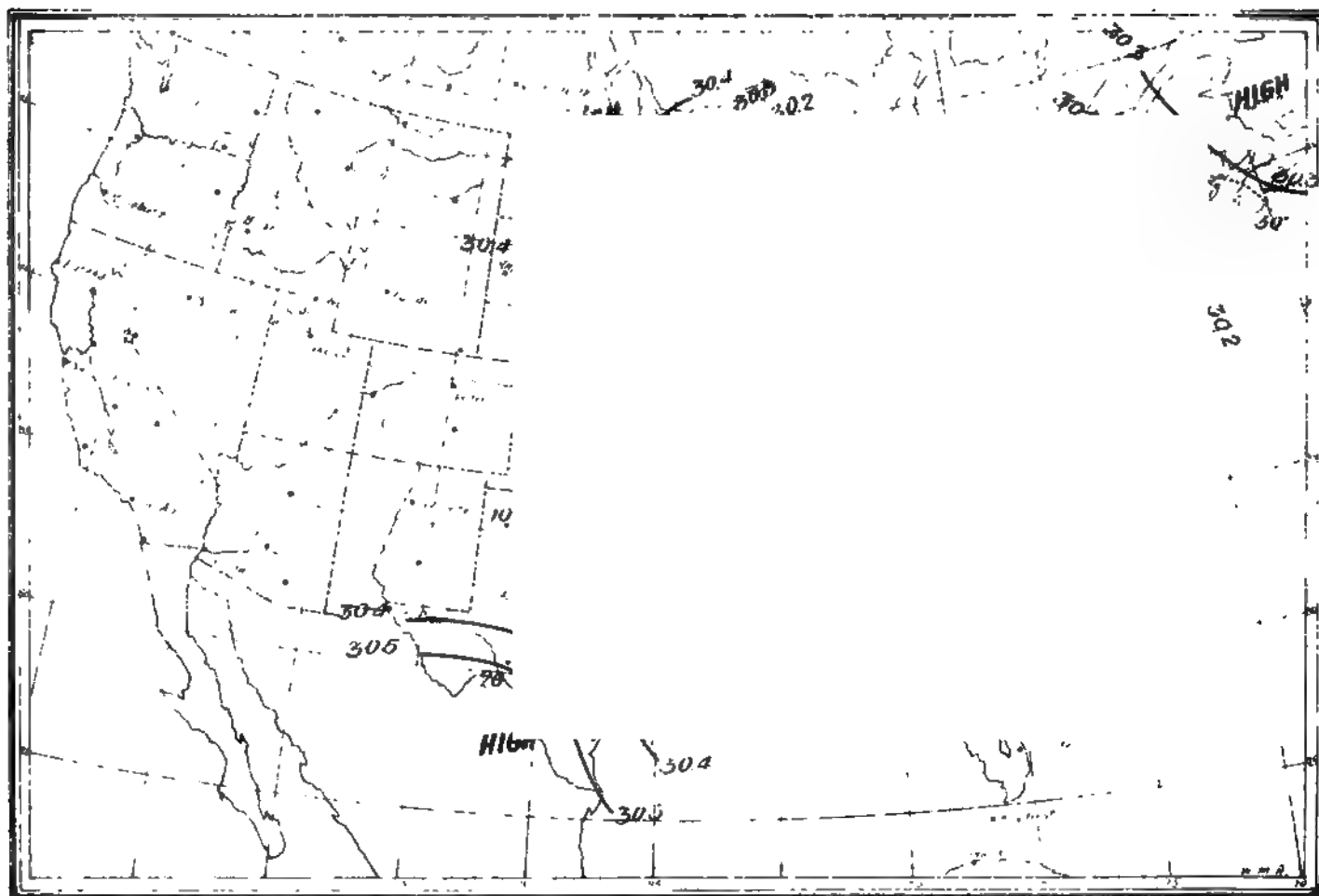


Chart XCVII.

February 18, 1884—11 p. m.

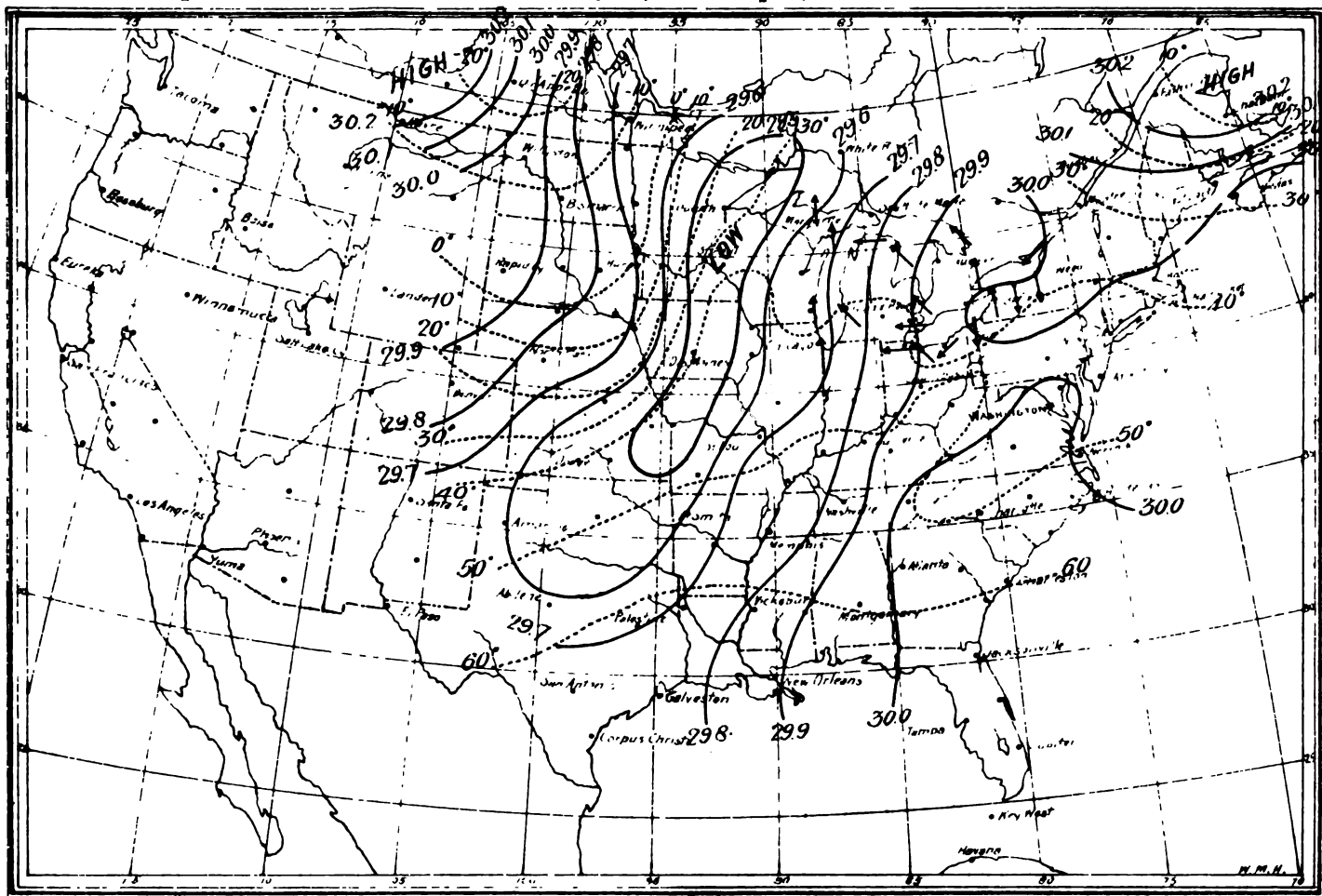


Chart XCVIII.

February 19, 1884—7 a. m.

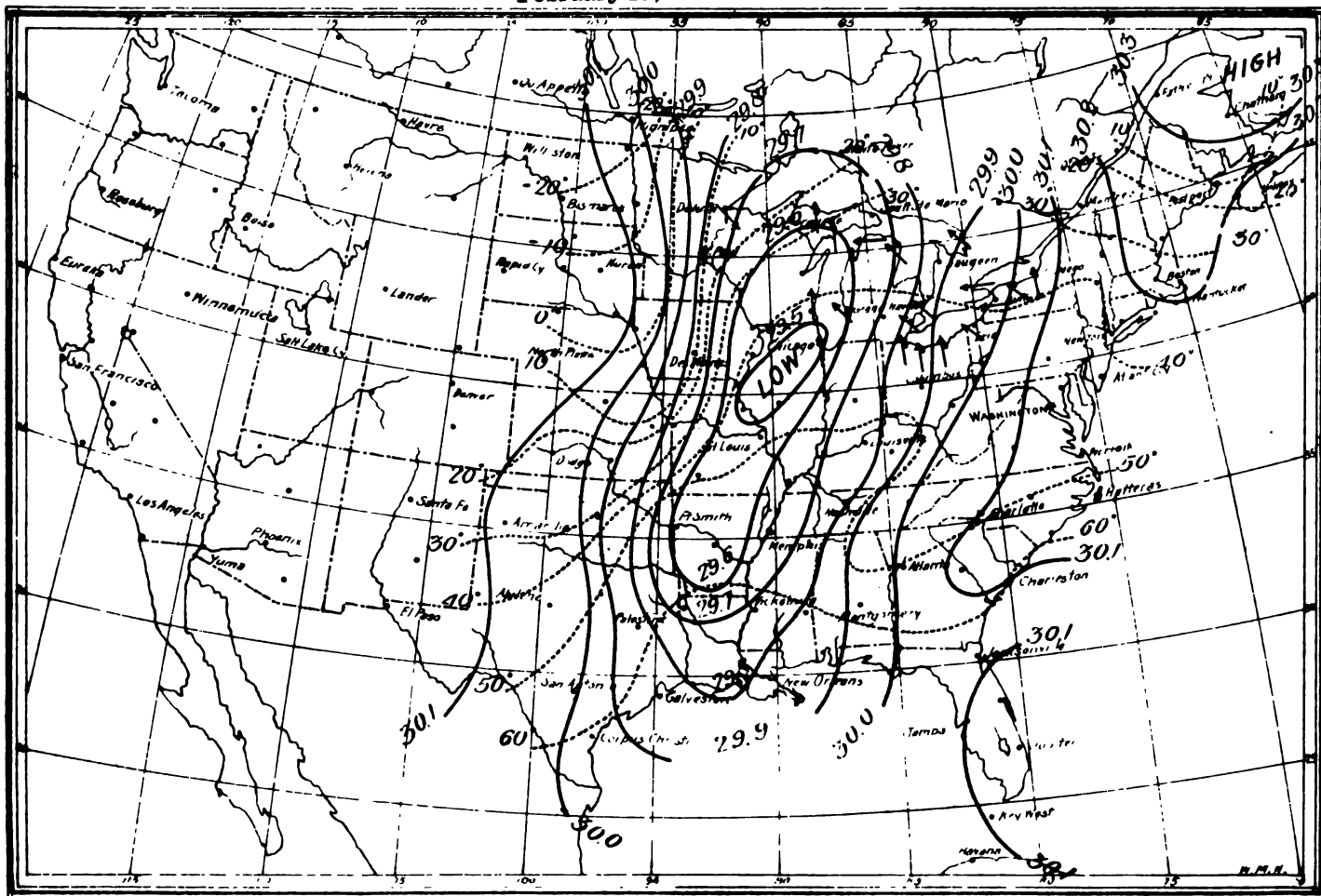


Chart XIX

February 19, 1884—3 p. m.

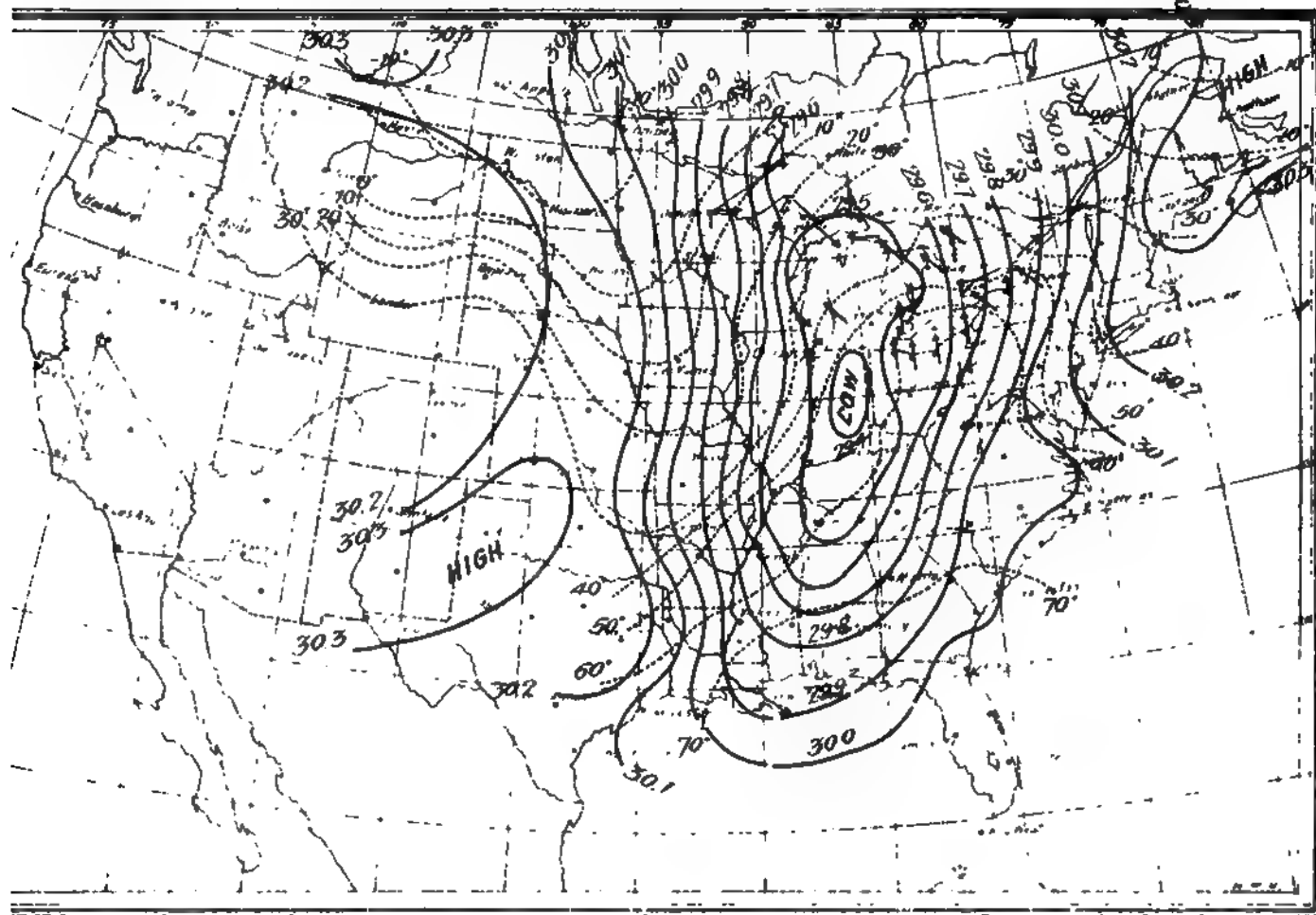


Chart C.

February 19, 1884—11 p. m.

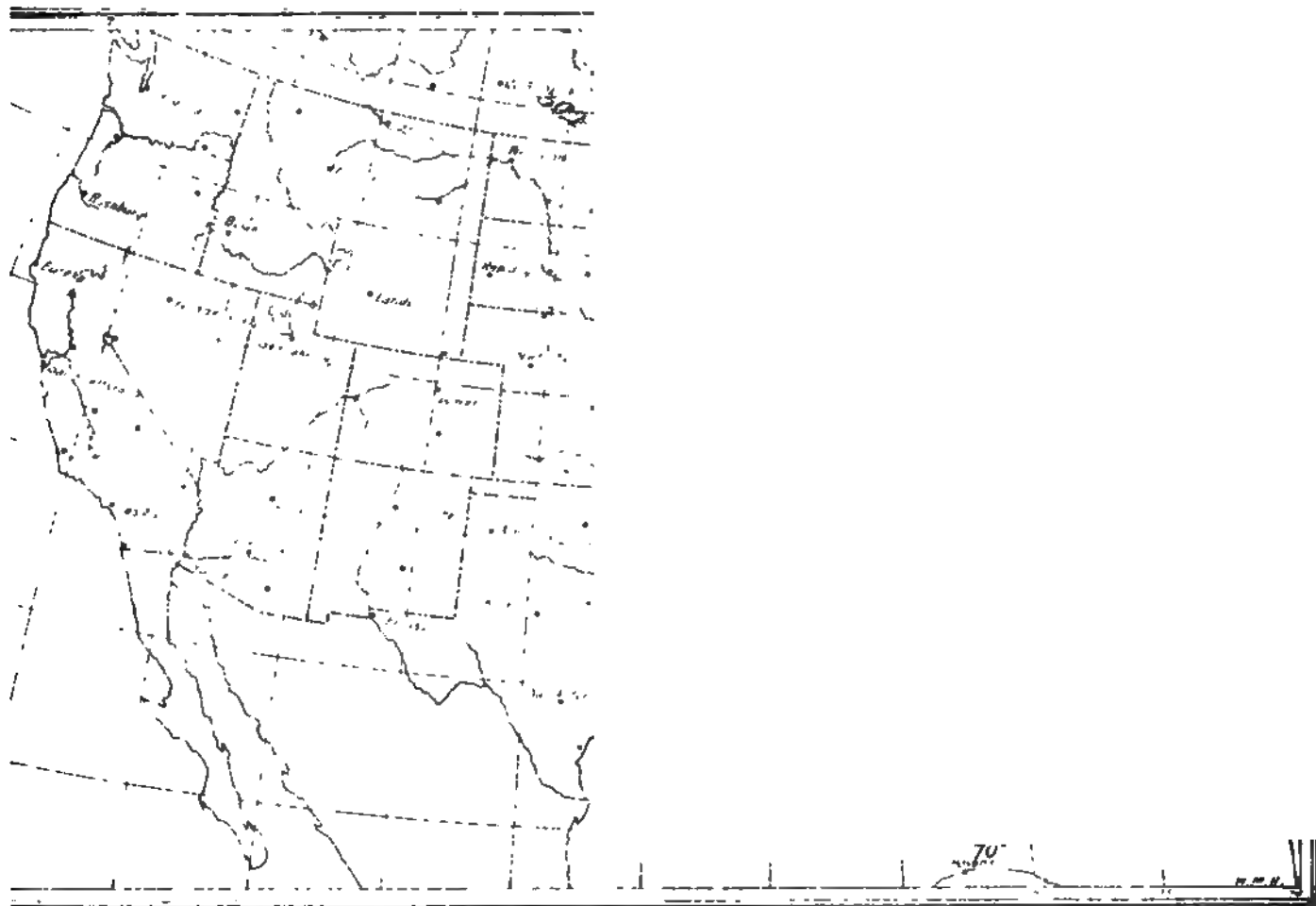


Chart CI.

February 9, 1885—7 a. m.

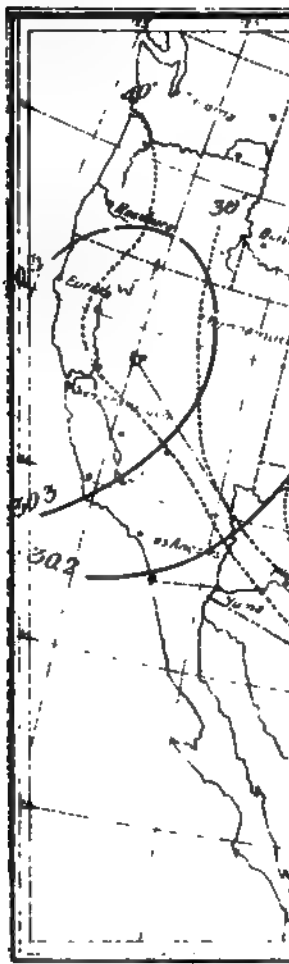


Chart CII.

February 9, 1885—3 p. m.

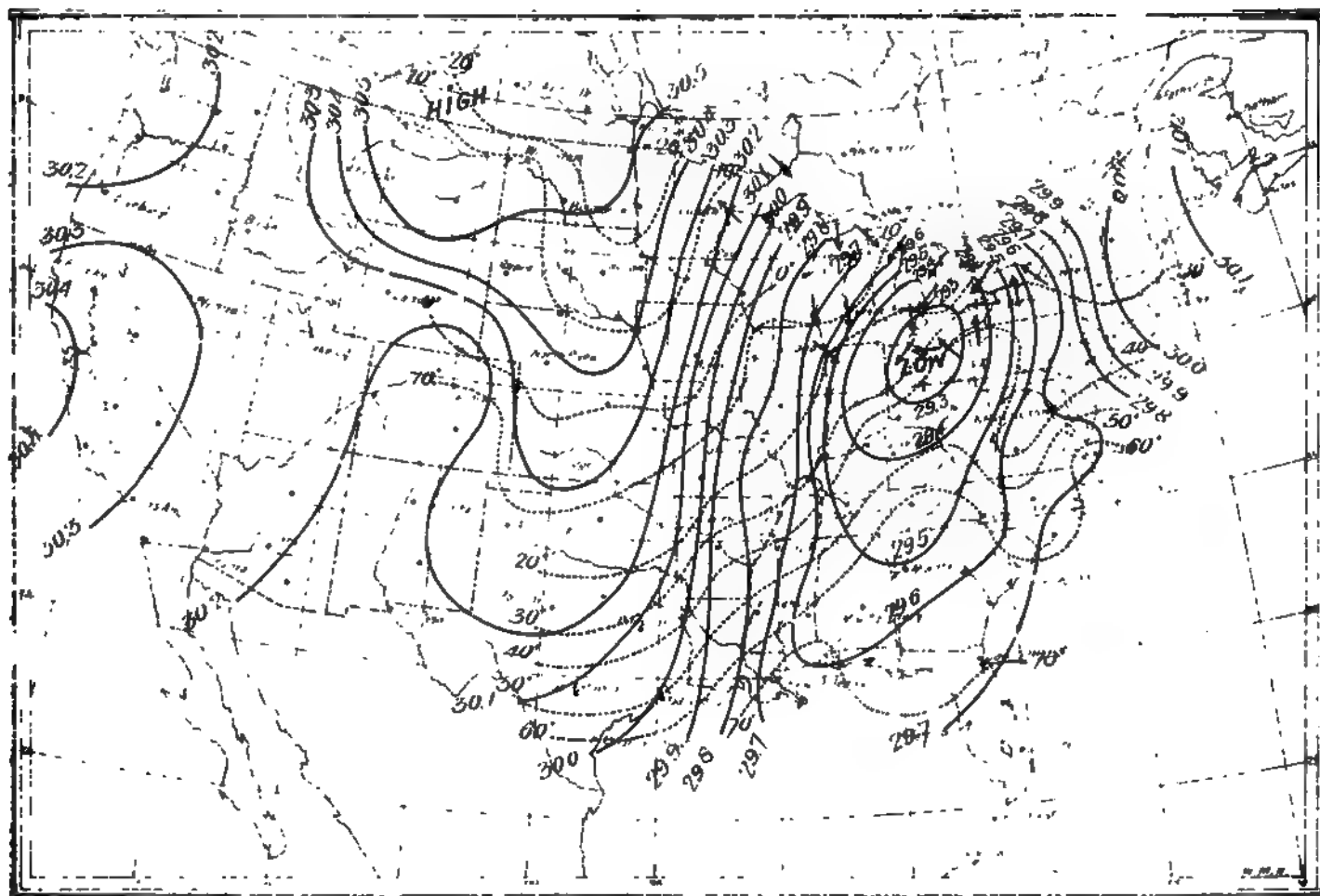


Chart CIII.

February 9, 1885—11 p. m.

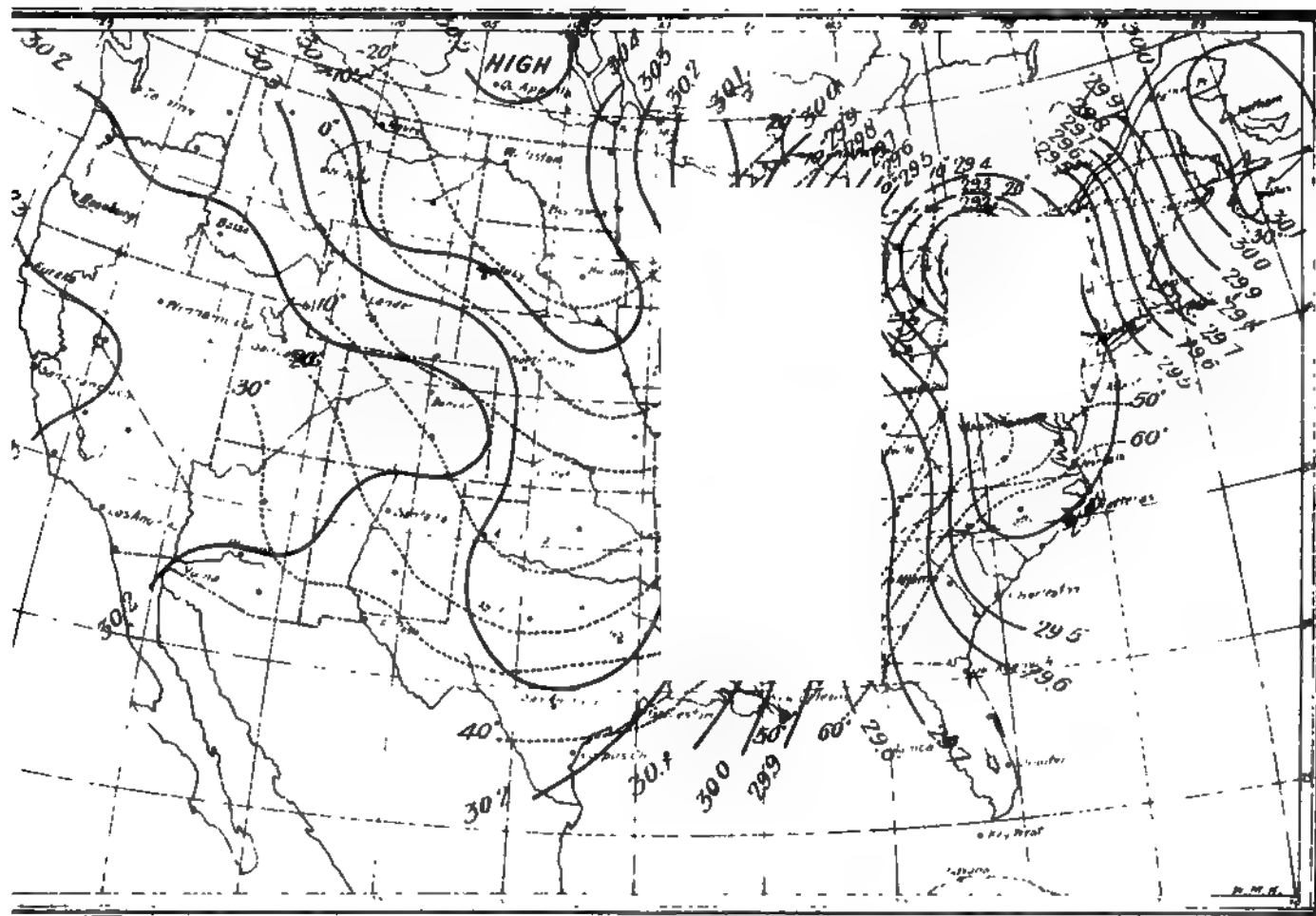


Chart CIV.

February 10, 1885—7 a. m.

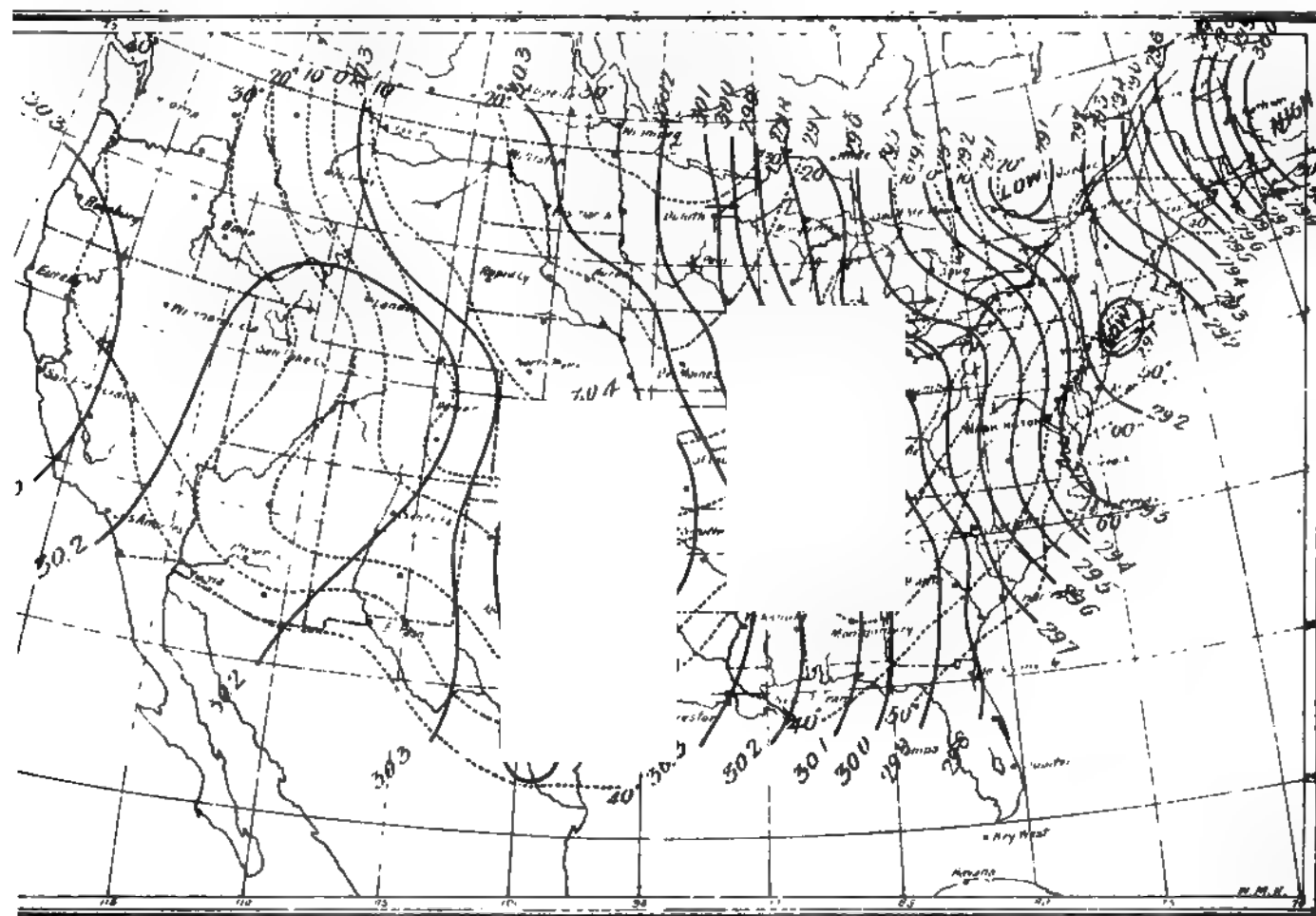


Chart OV.

February 25, 1887—3 p. m.

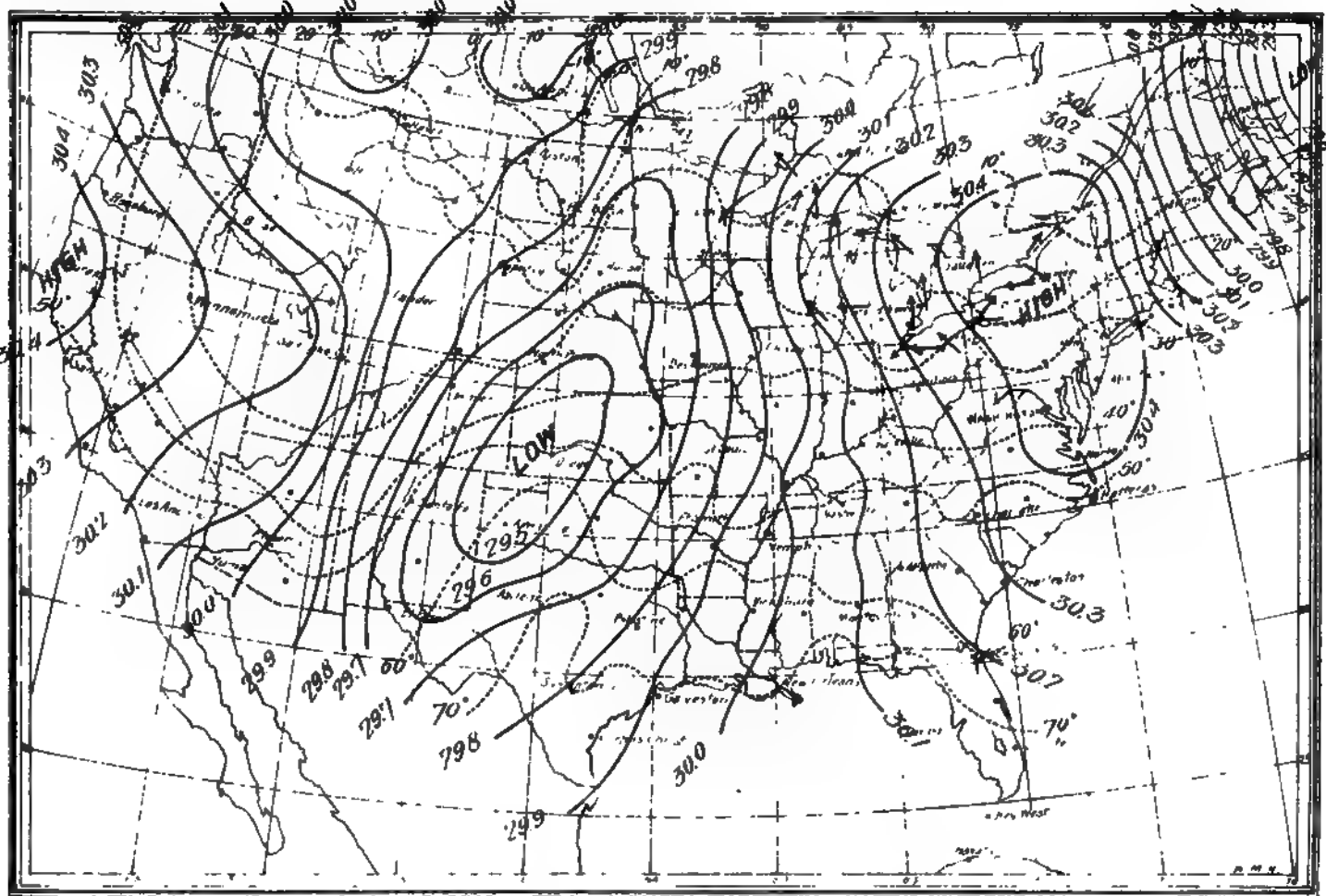
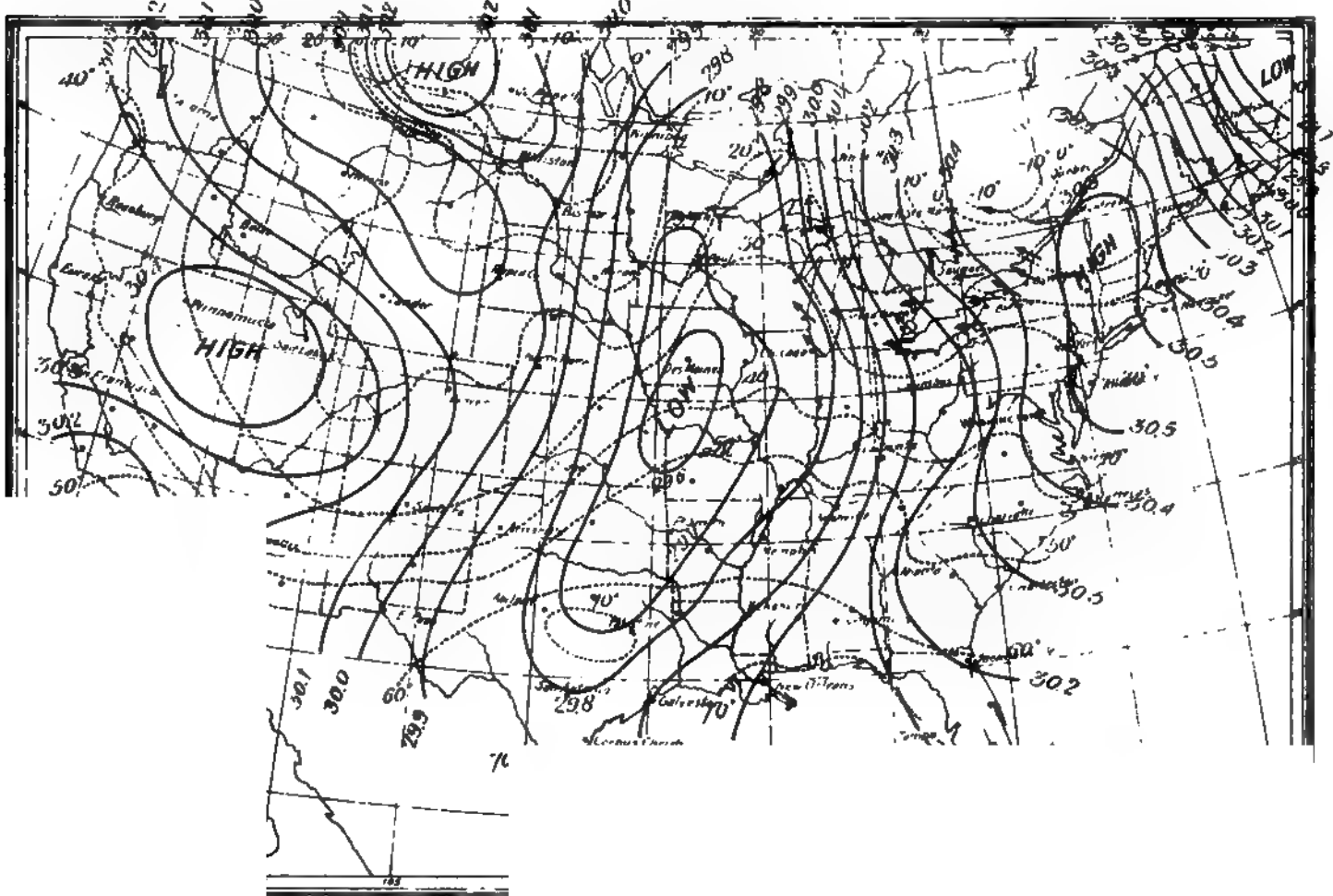
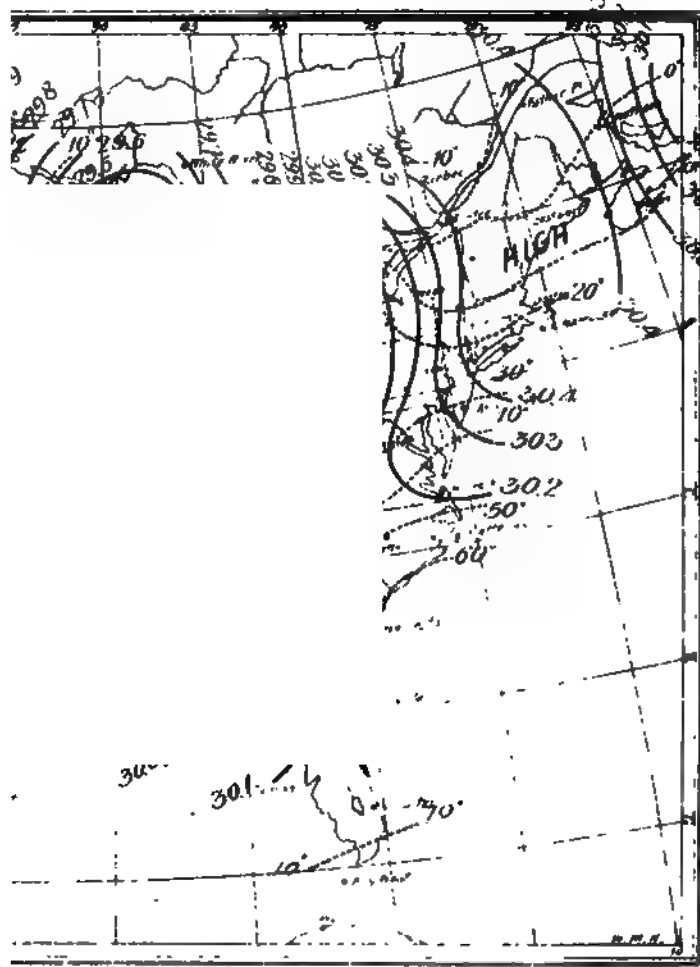


Chart OVI.

February 25, 1887—10 p. m.



February 26, 1887—7 a. m.



February 26, 1887—3 p. m.

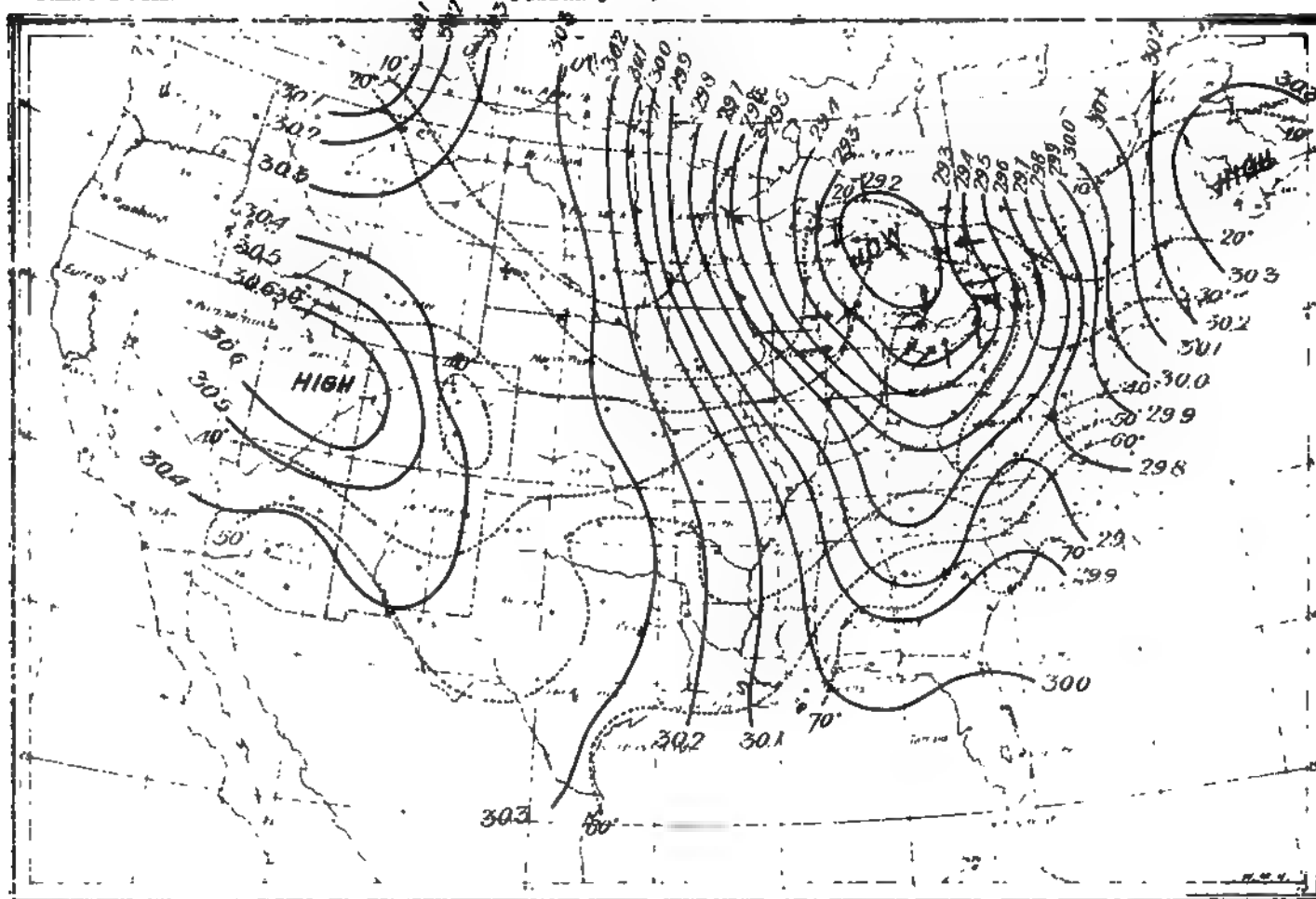


Chart OIX.

February 23, 1888-10 p. m.

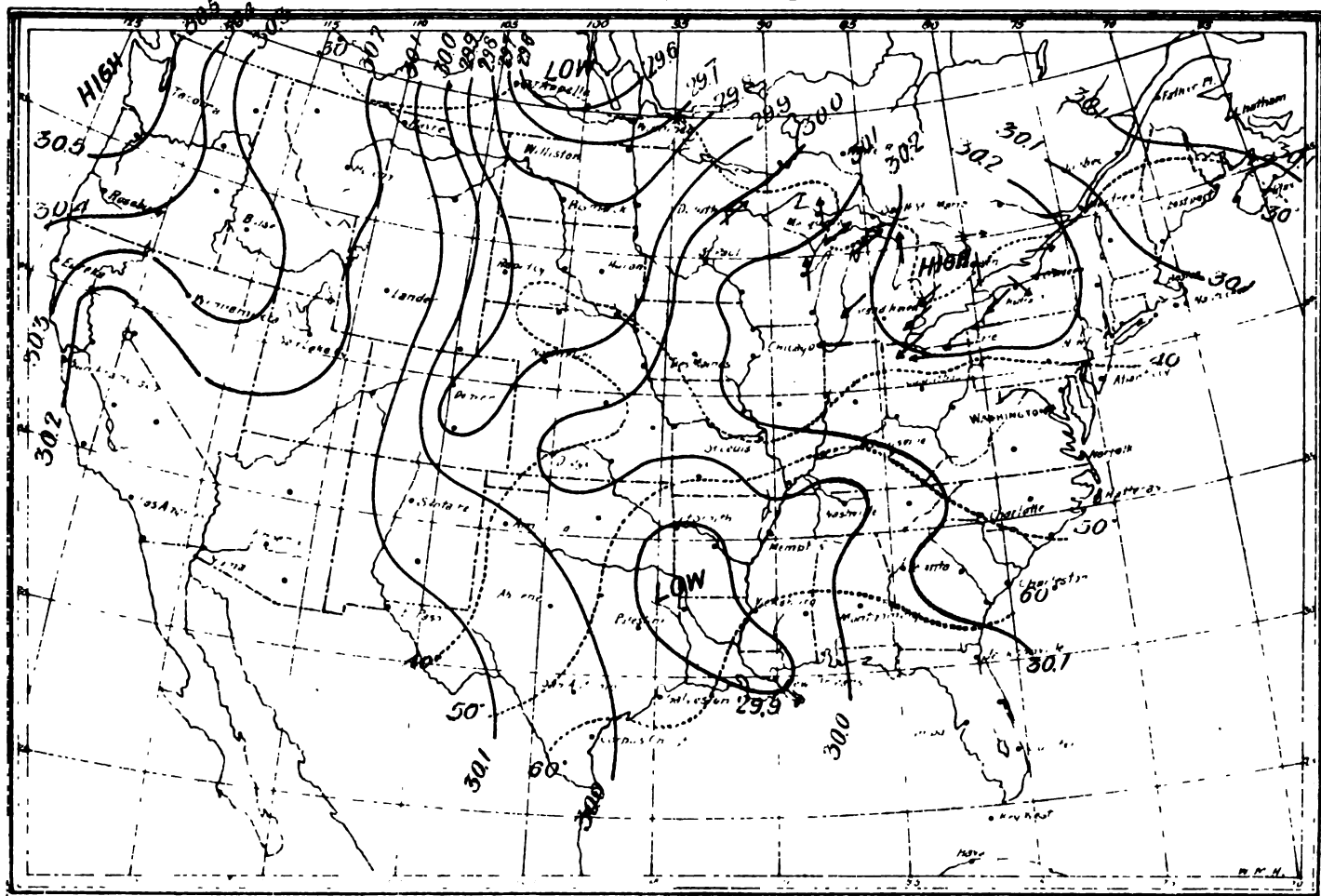


Chart OX.

February 24, 1888-7 a. m.

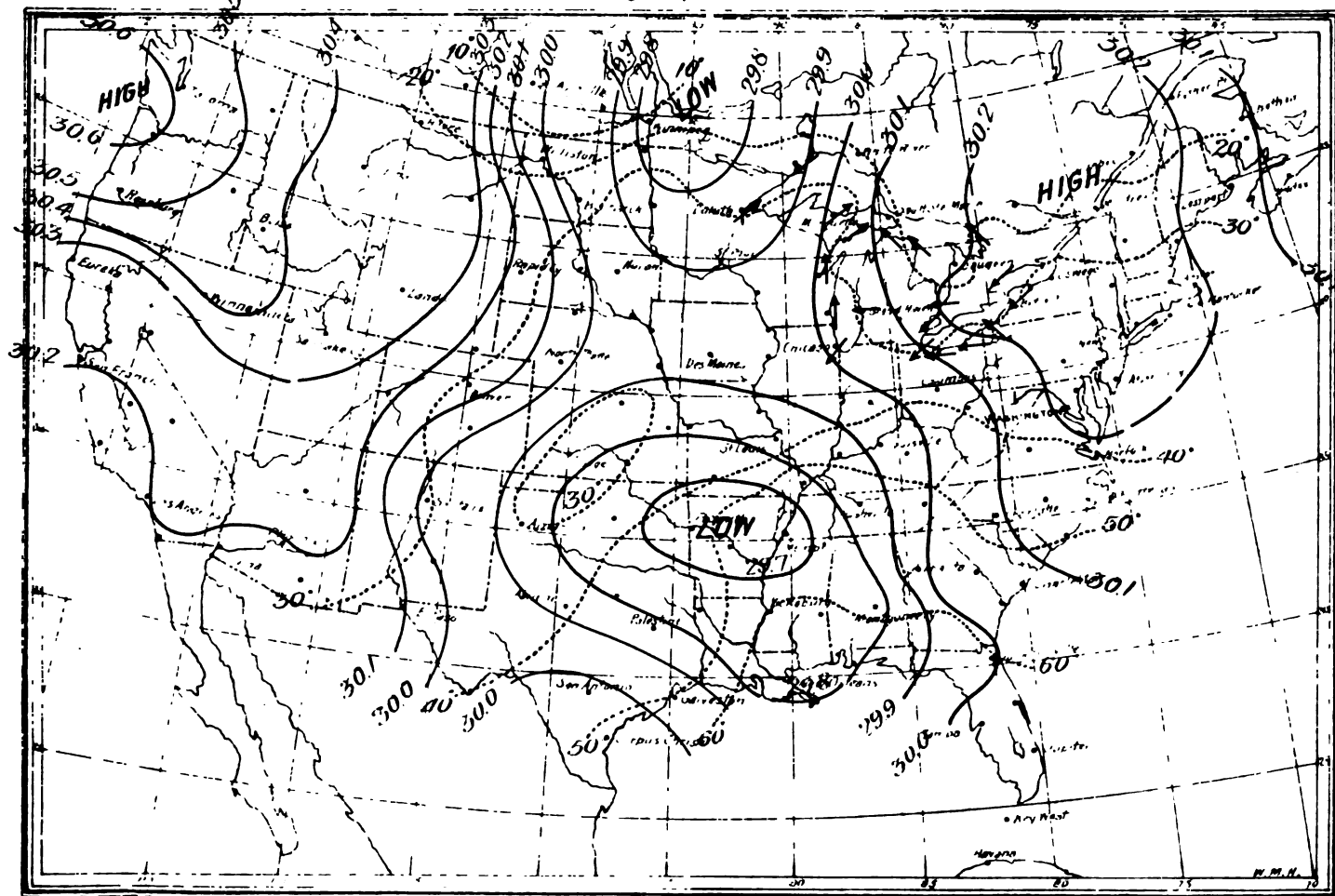


Chart OXI.

February 24, 1888—3 p. m.

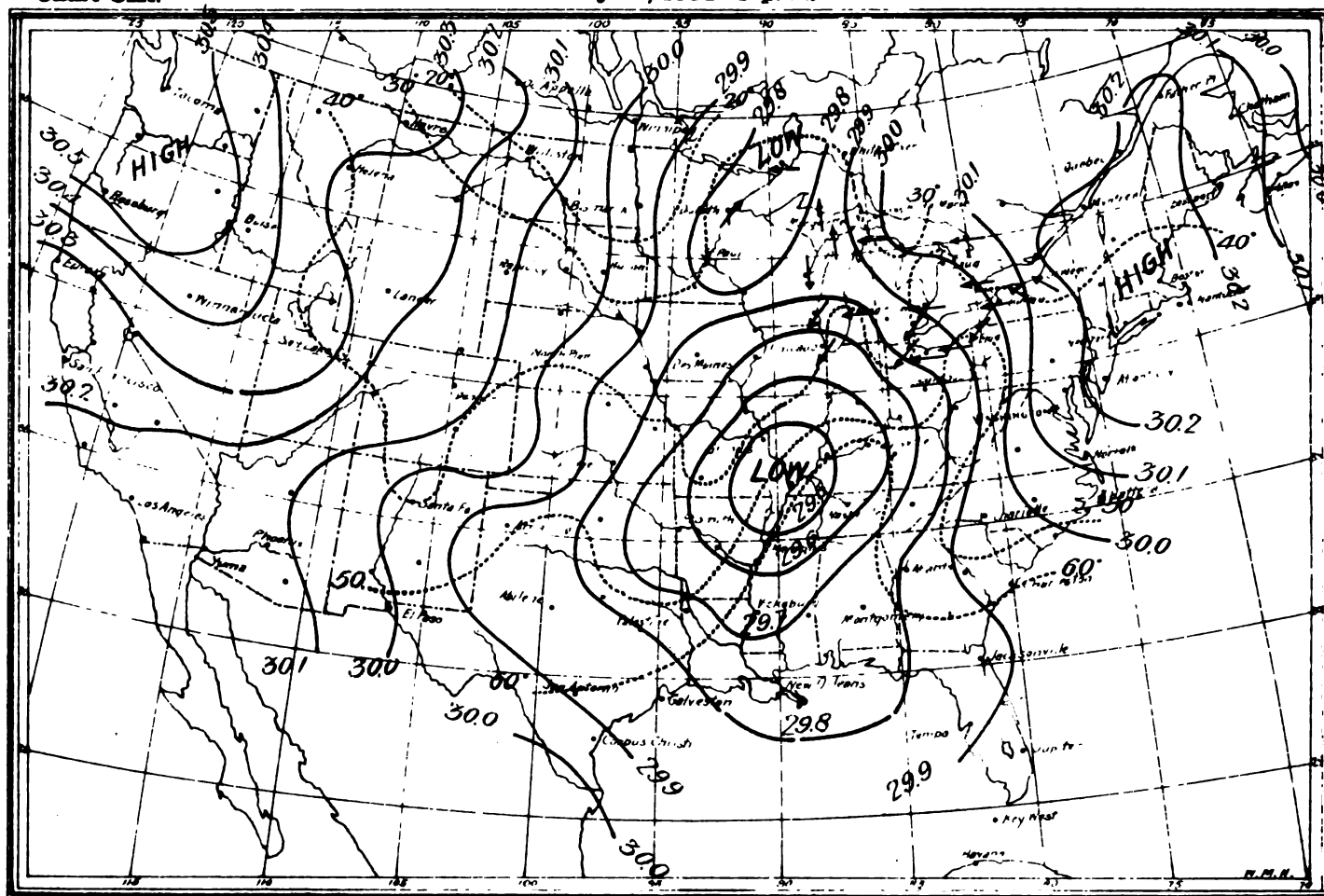
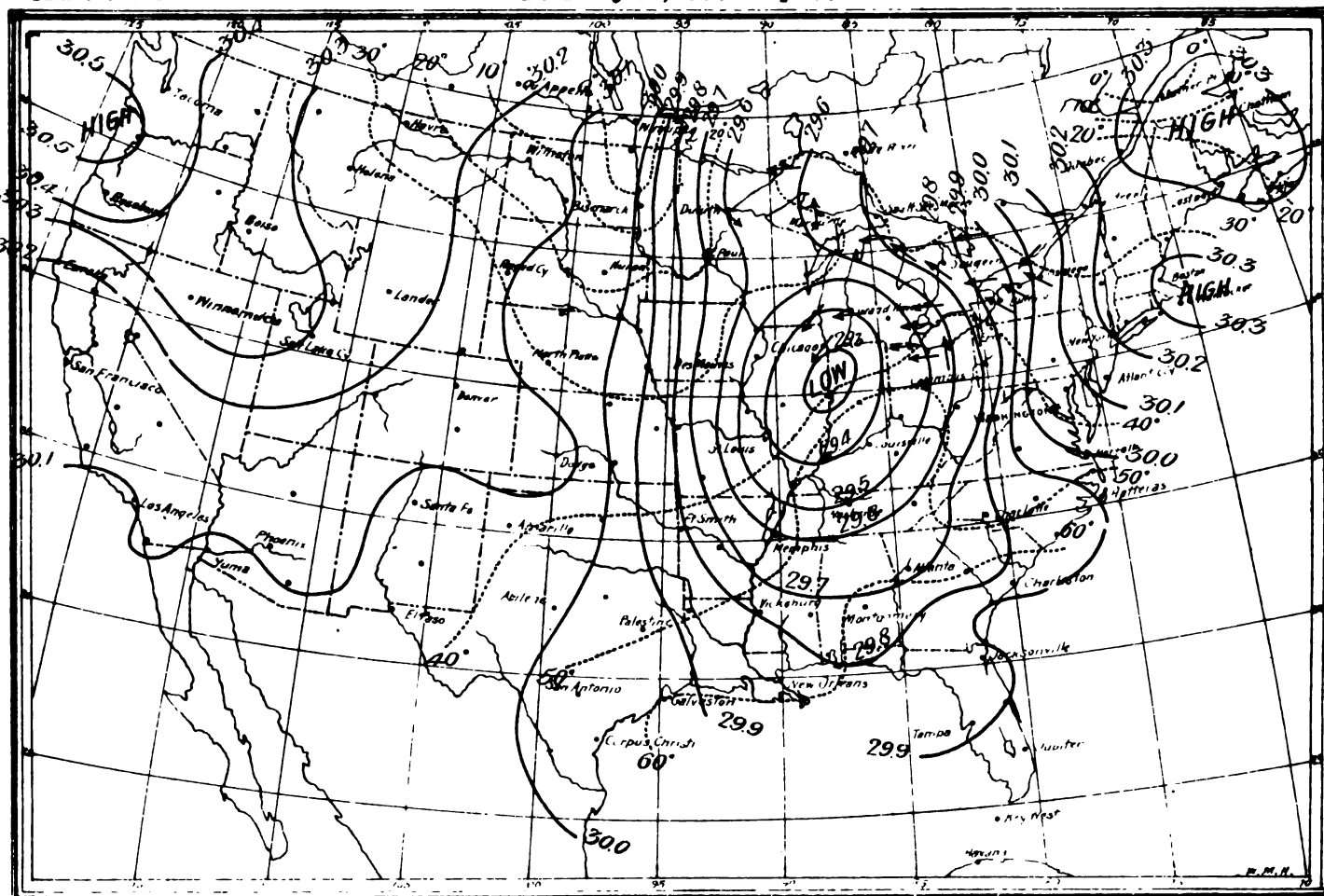


Chart OXII.

February 24, 1888—10 p. m.



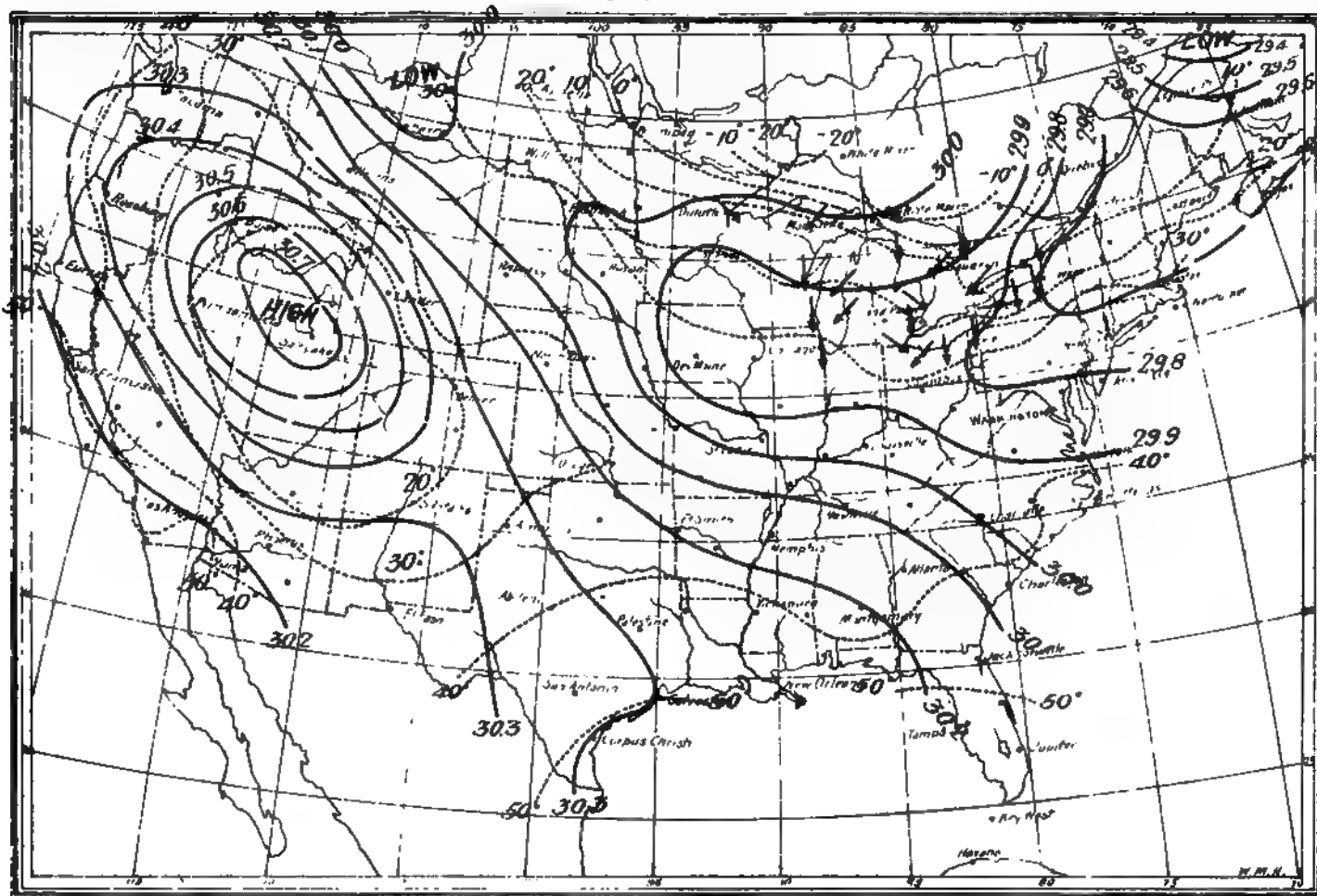


Chart OXIV.

February 8, 1889—8 p. m.

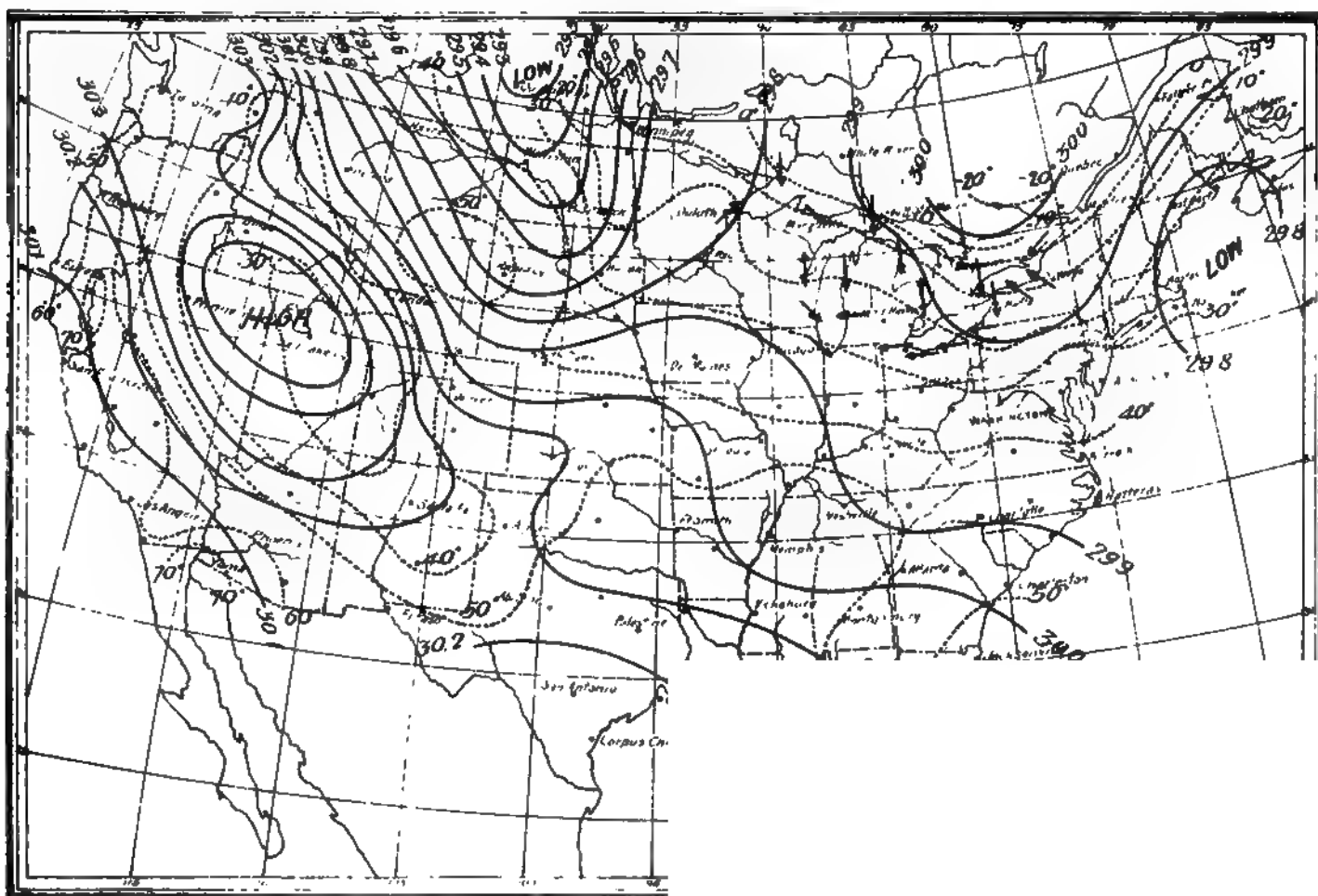


Chart OXV.

February 4, 1889—8 a. m.

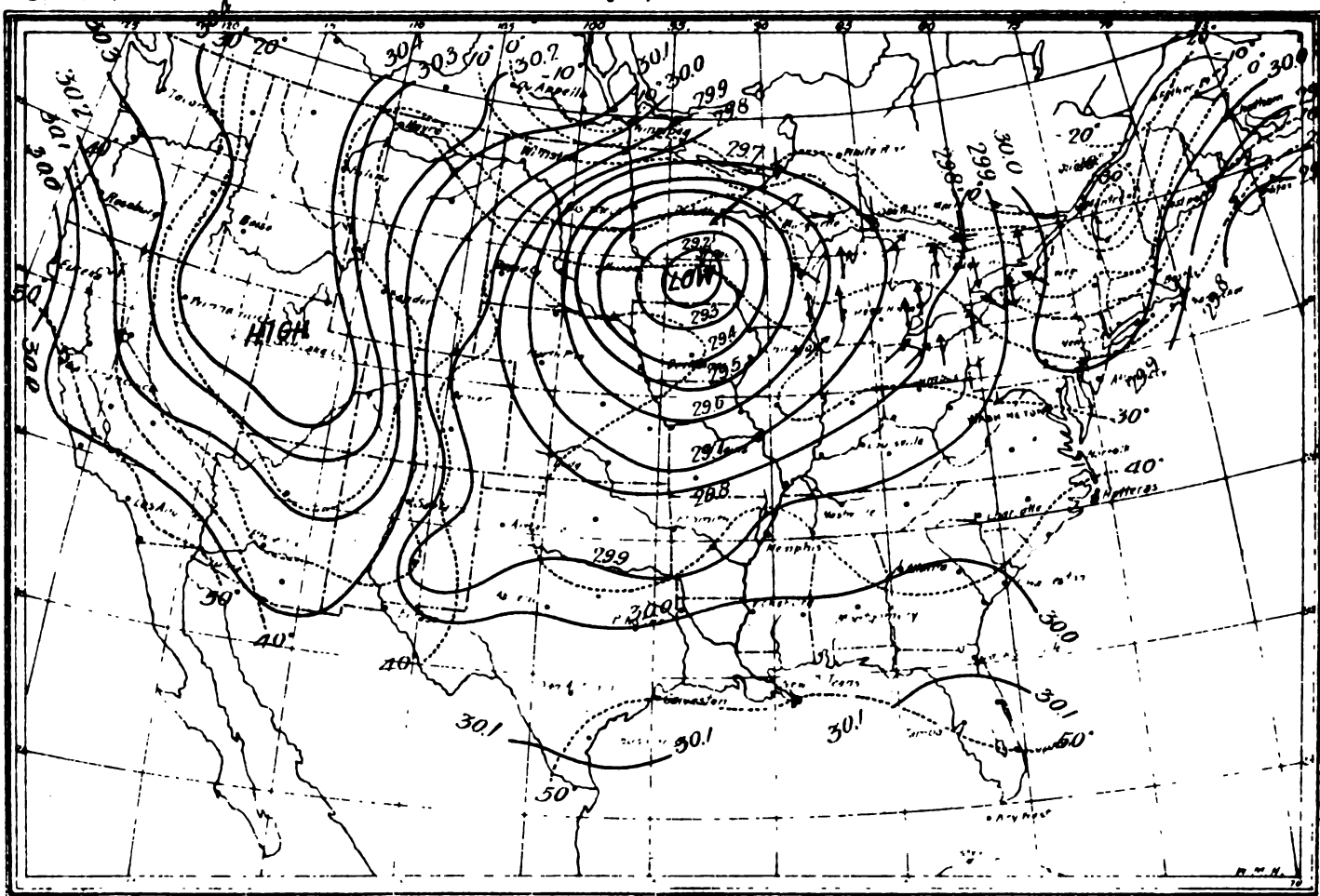


Chart OXVI.

February 4, 1889—8 p. m.

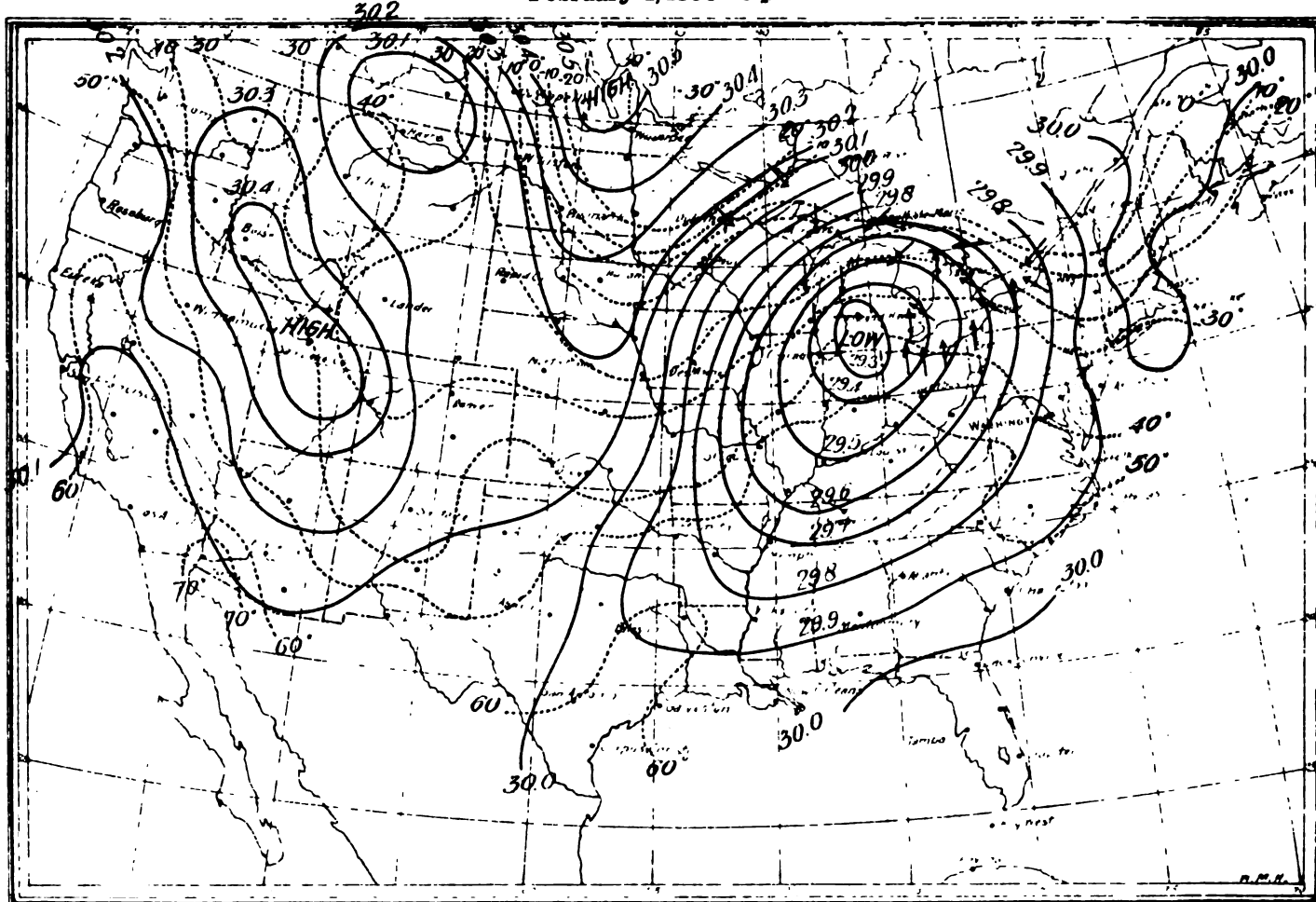


Chart OXVII.

February 6, 1892—8 a. m.

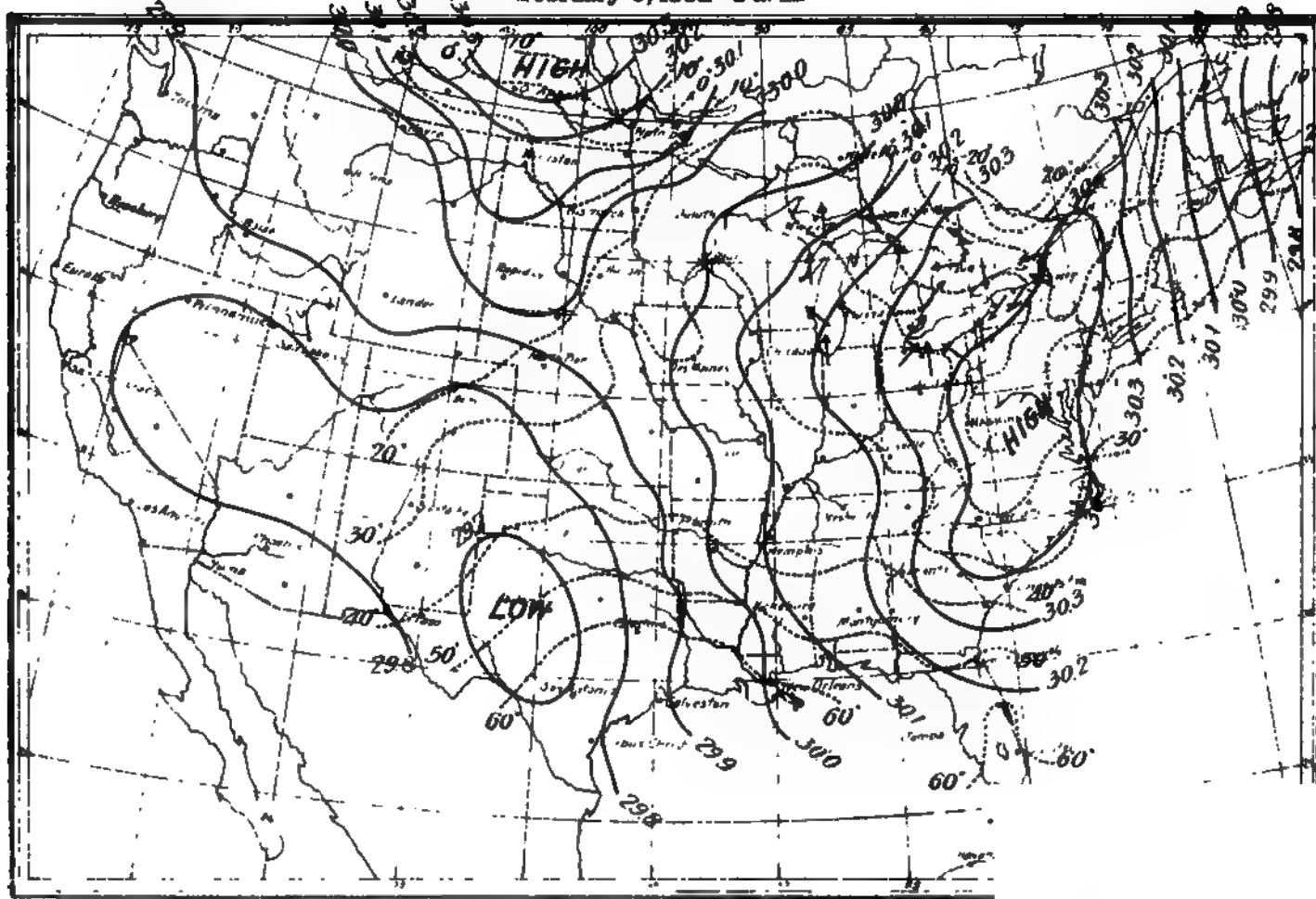


Chart OXVIII.

February 6, 1892—8 p. m.

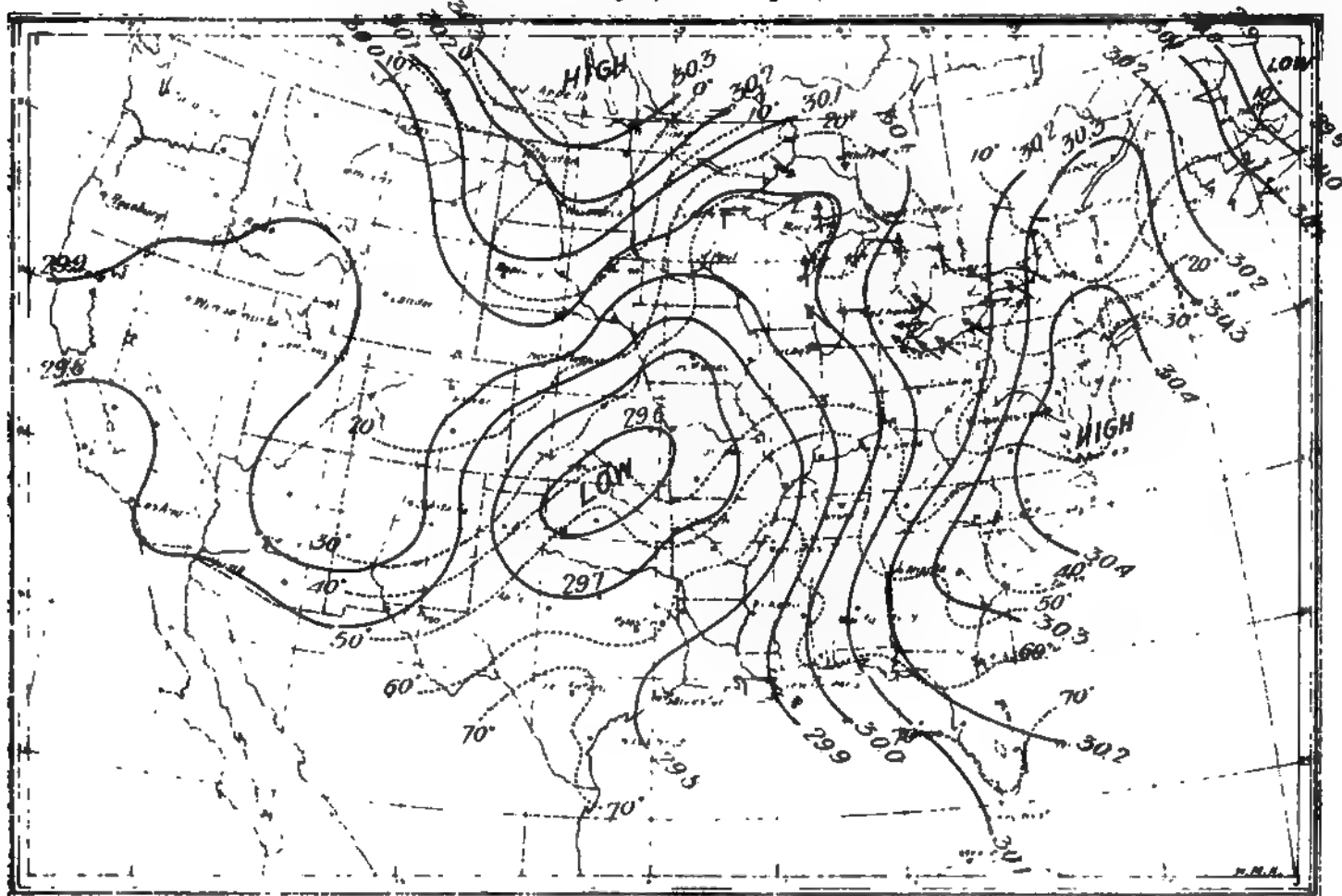


Chart OXIX.

February 7, 1892—8 a. m.

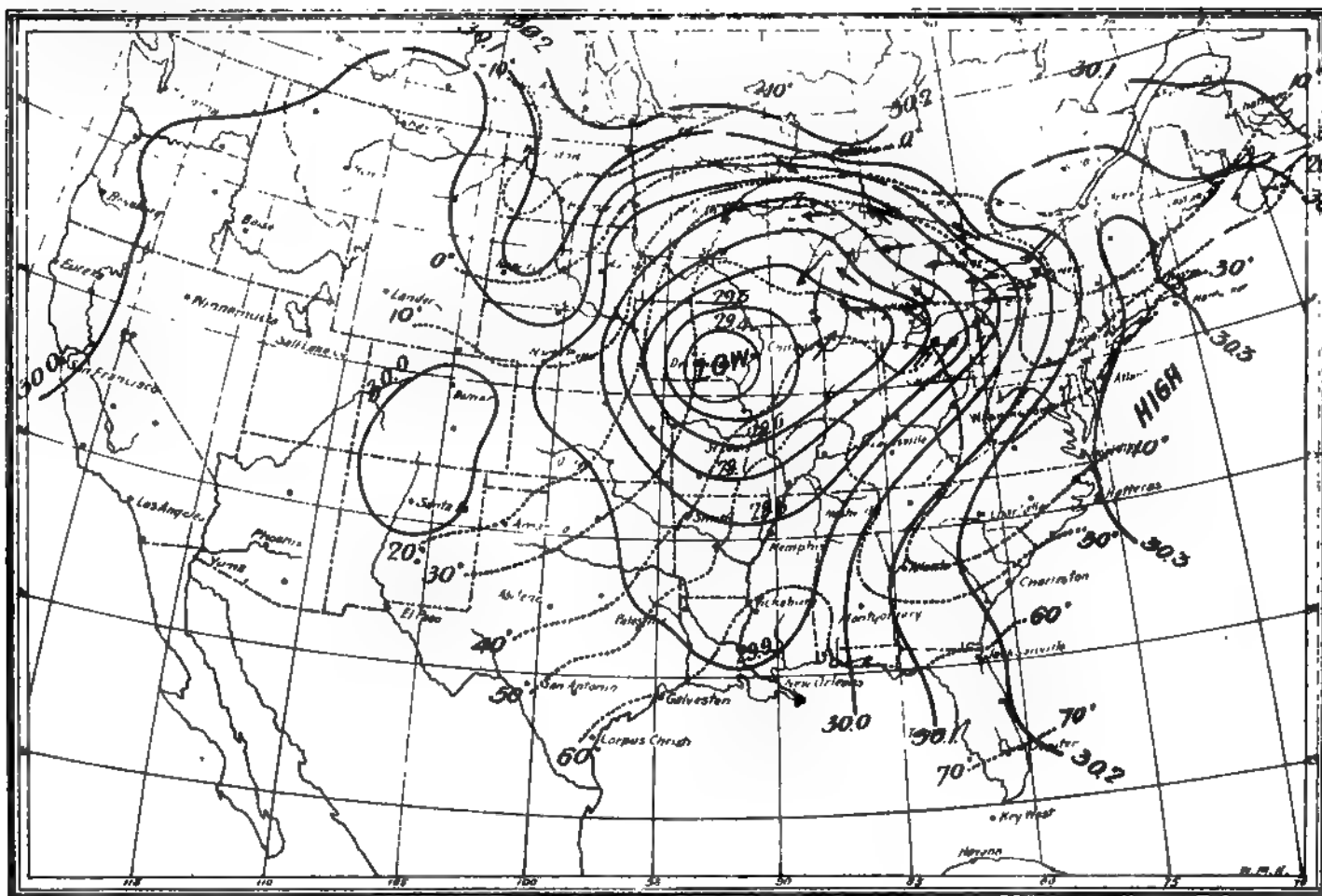


Chart OXX.

February 7, 1892—8 p. m.

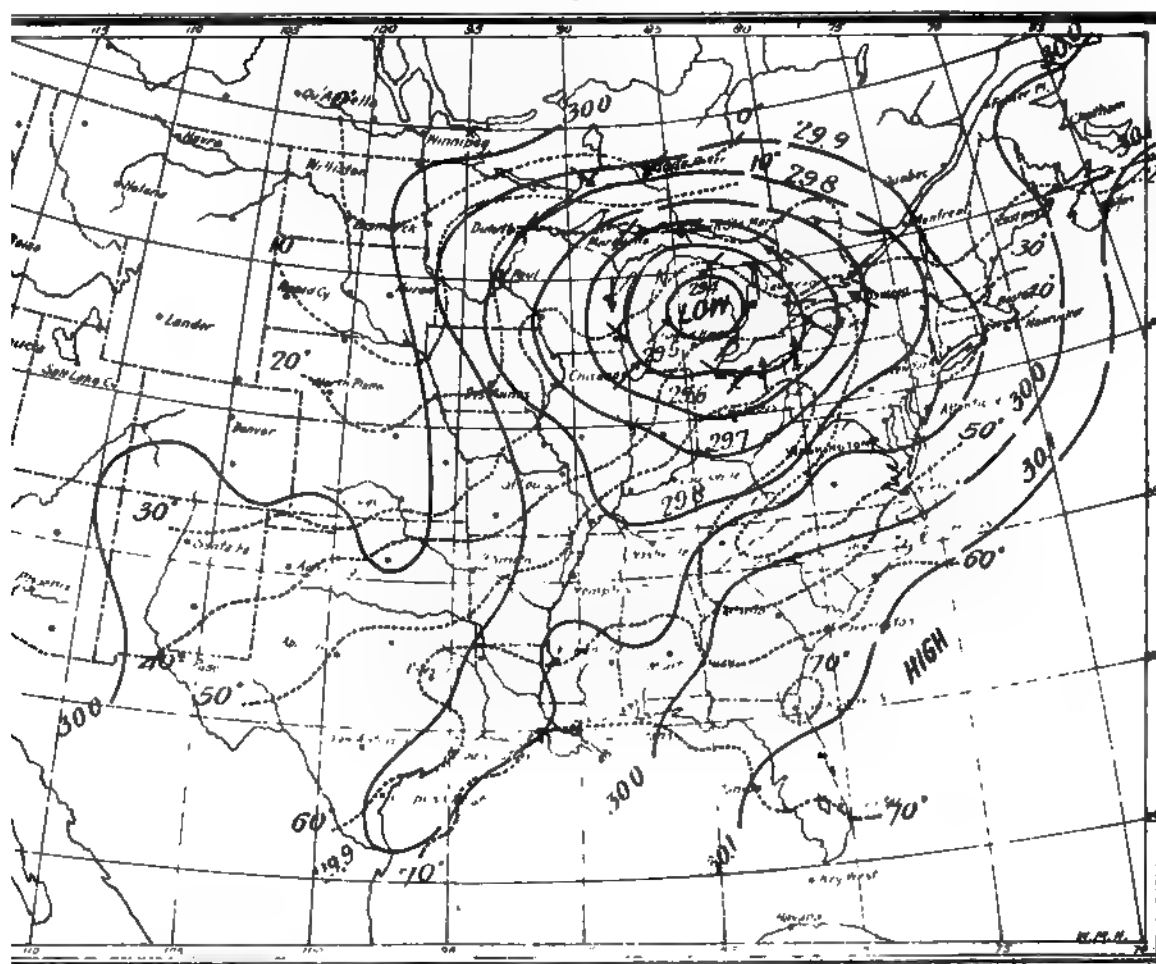


Chart OXXI.

February 1, 1893—8 a. m.

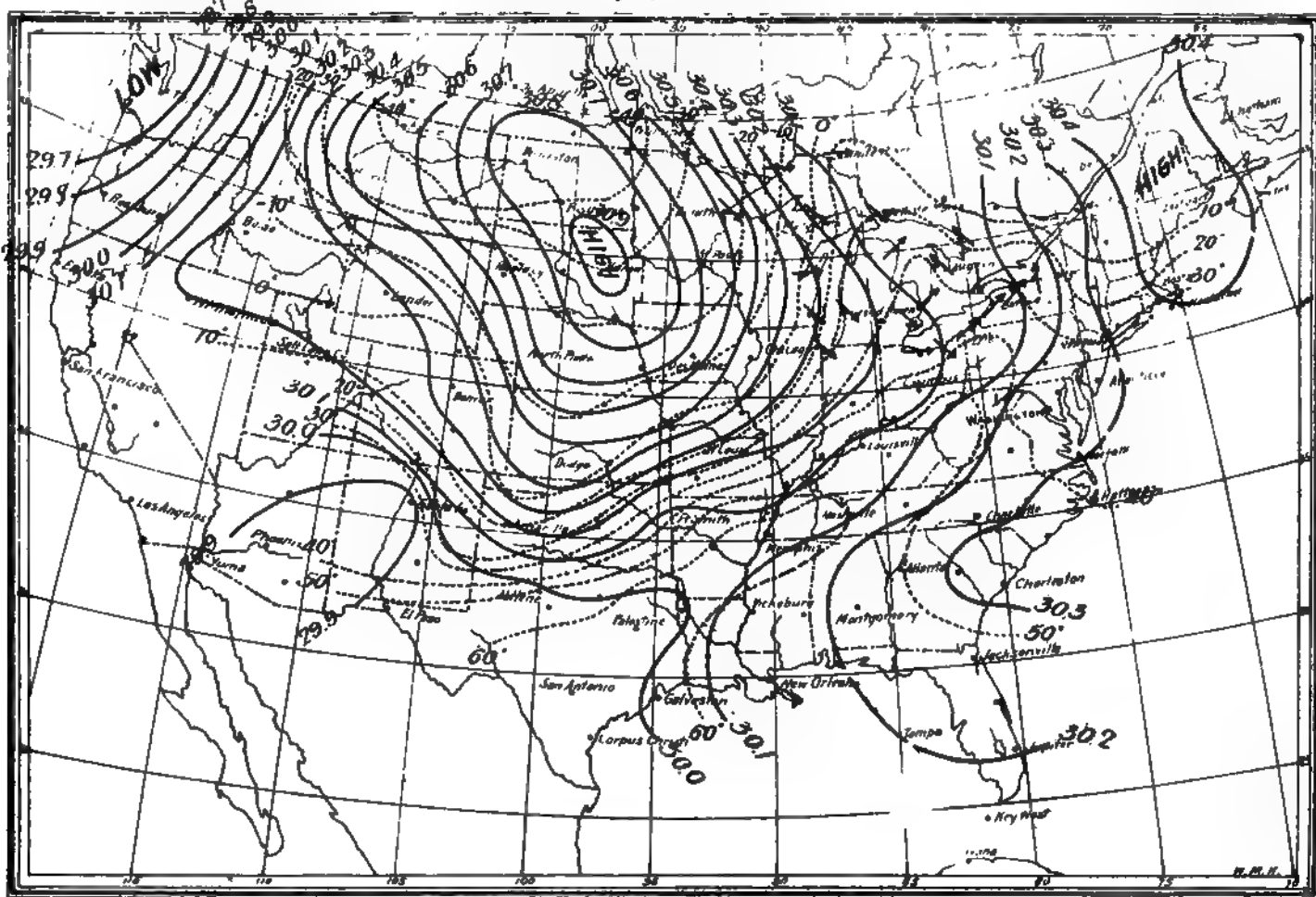


Chart OXXII.

February 1, 1893—8 p. m.

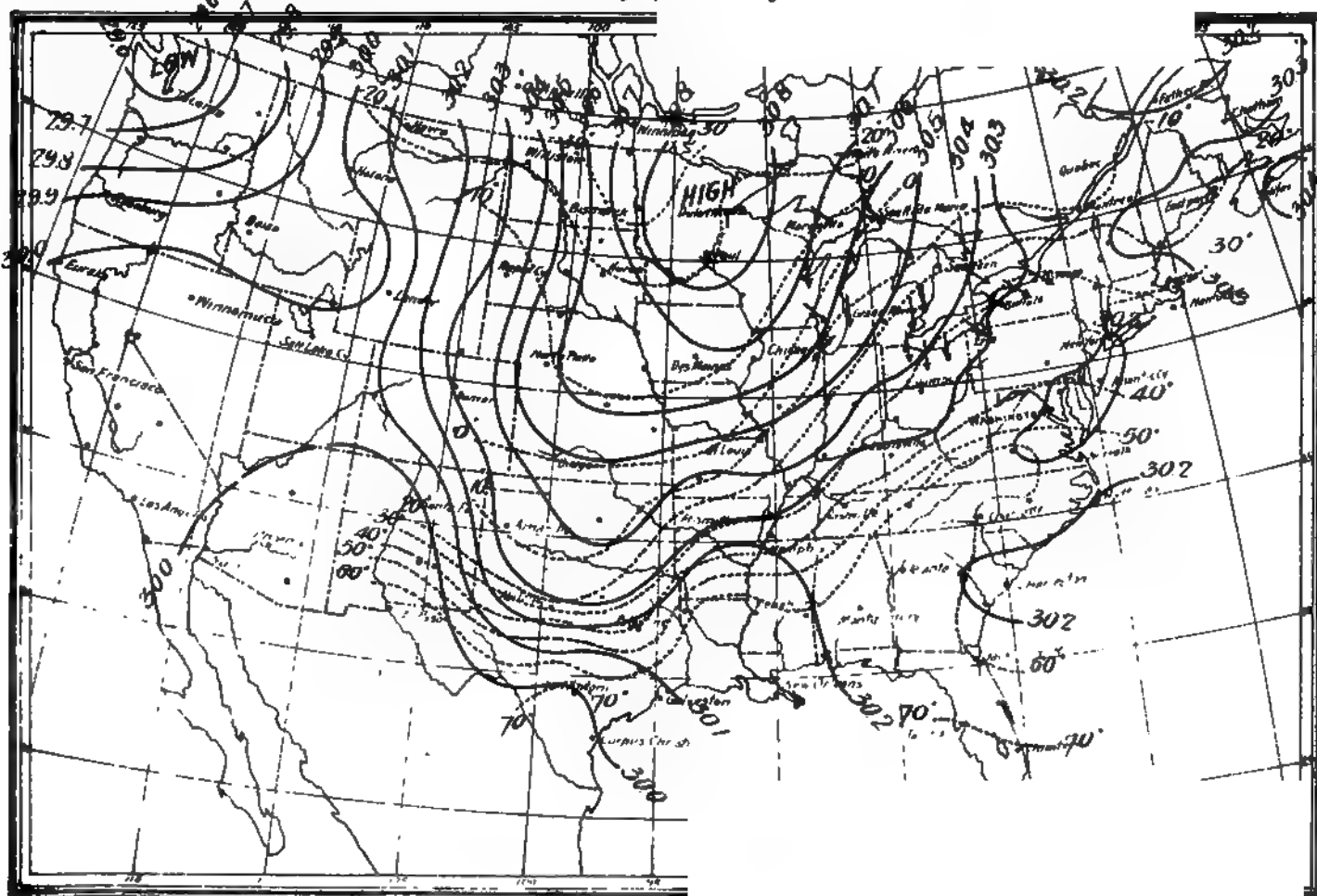


Chart OXXIII.

February 2, 1893—8 a. m.

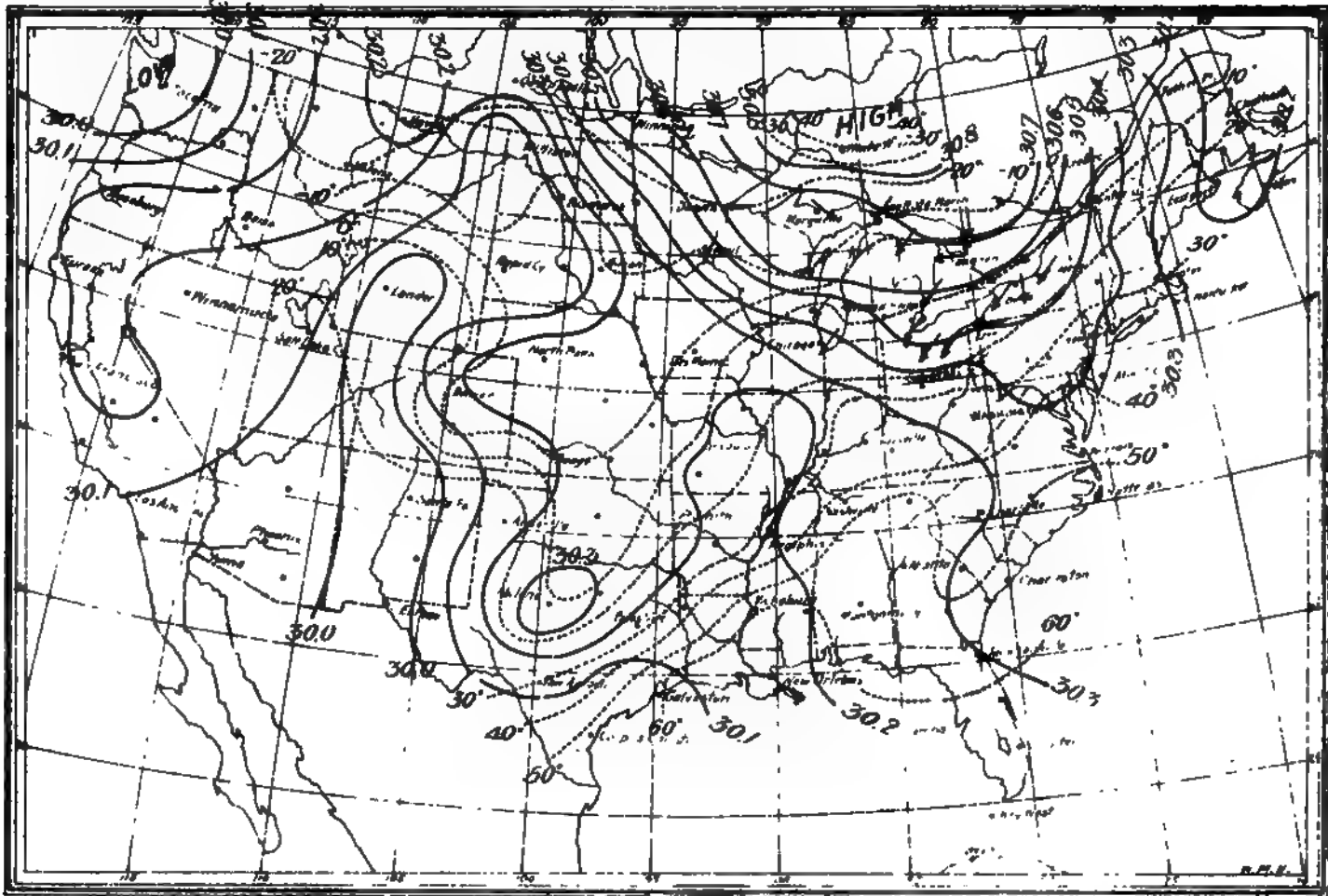


Chart OXXIV.

February 2, 1893—8 p. m.

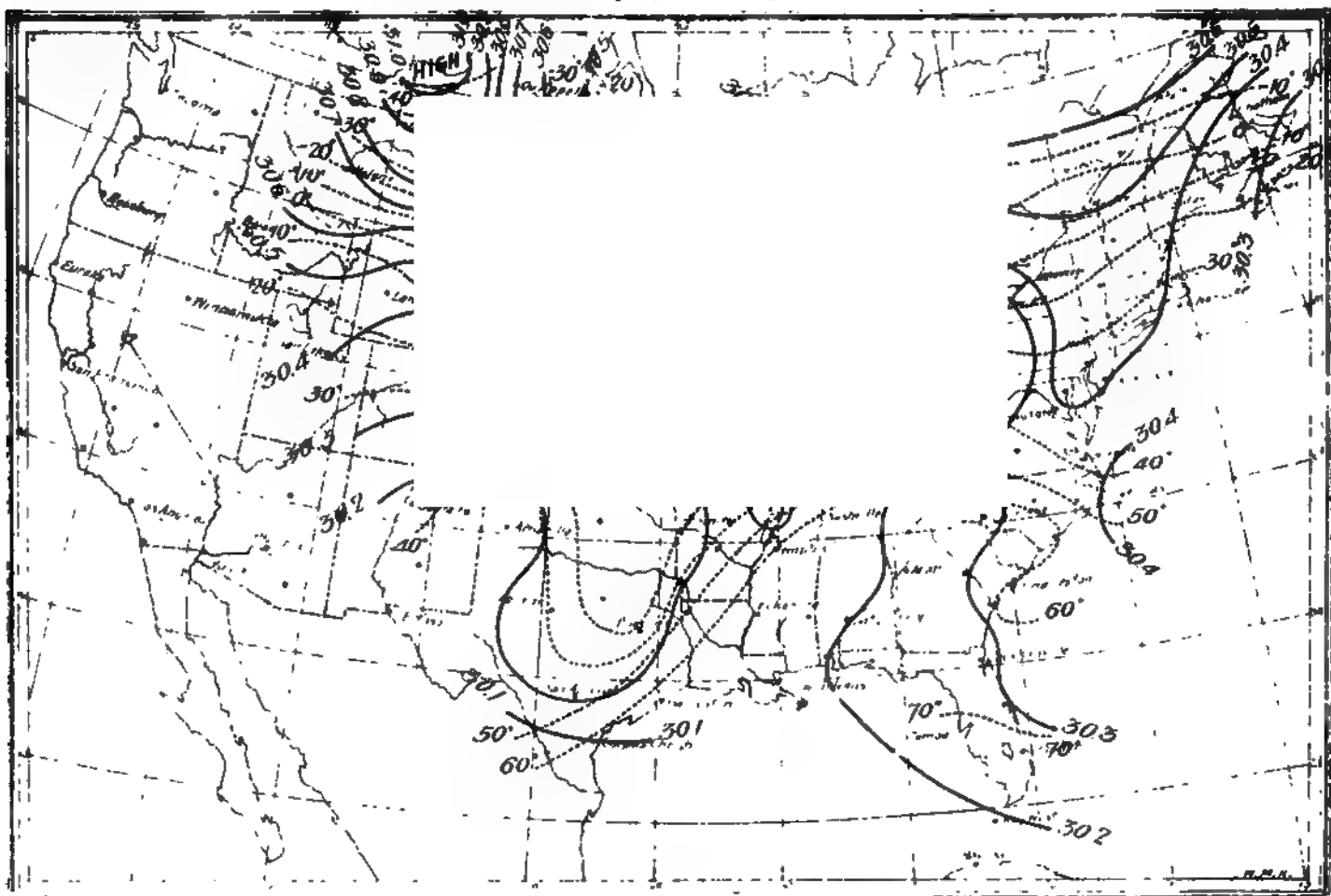
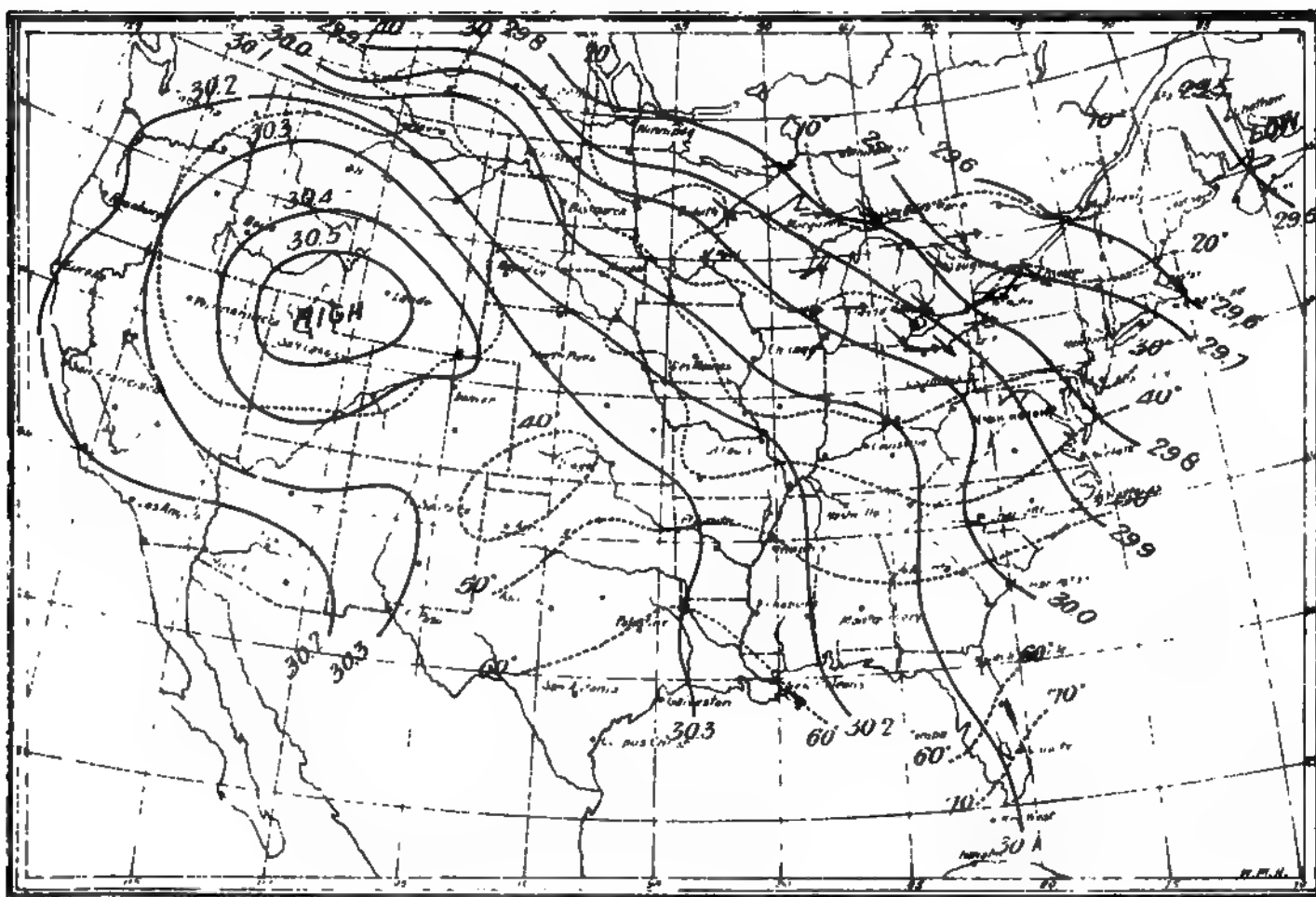


Chart CXXVI.

February 18, 1893—8 p. m.



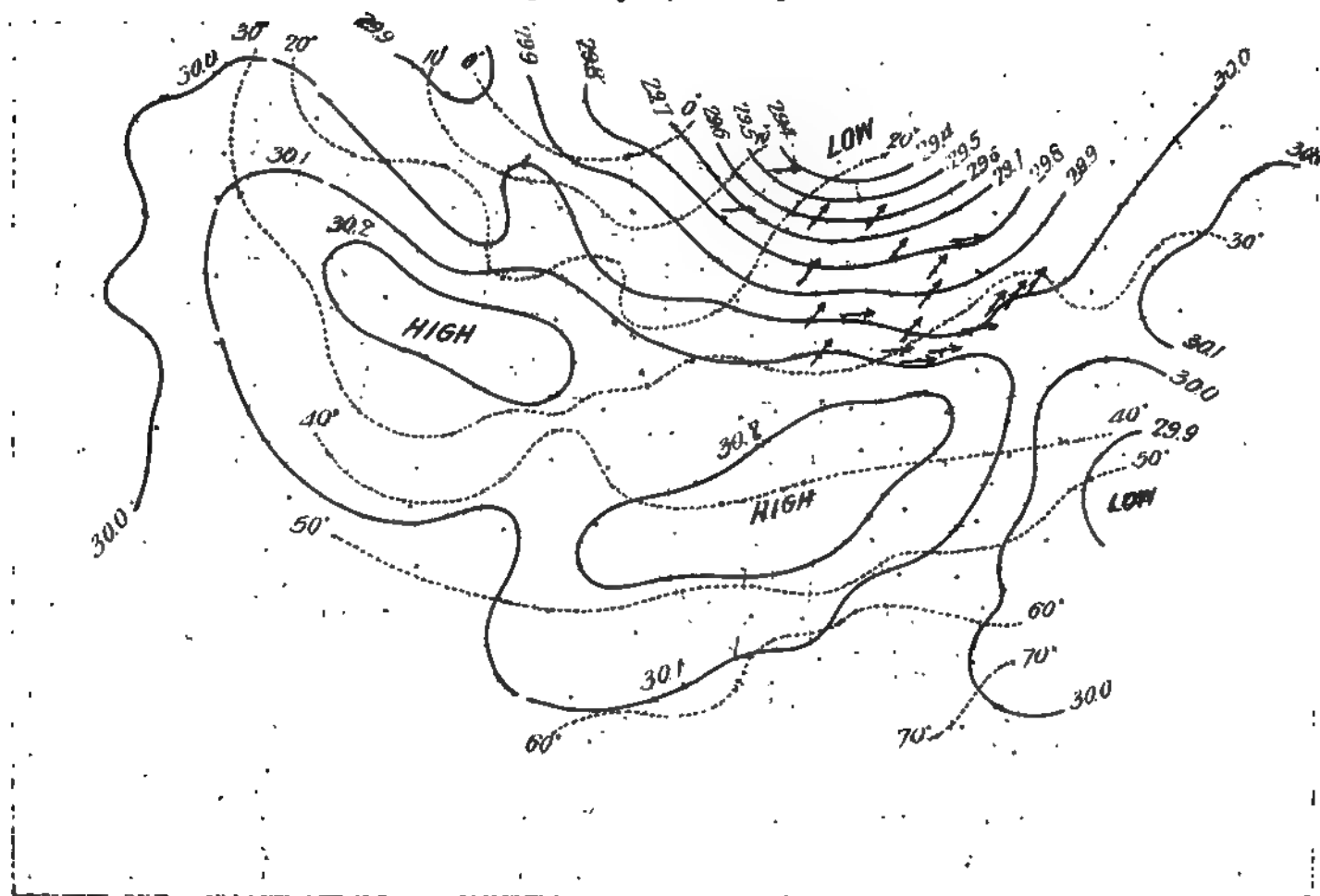
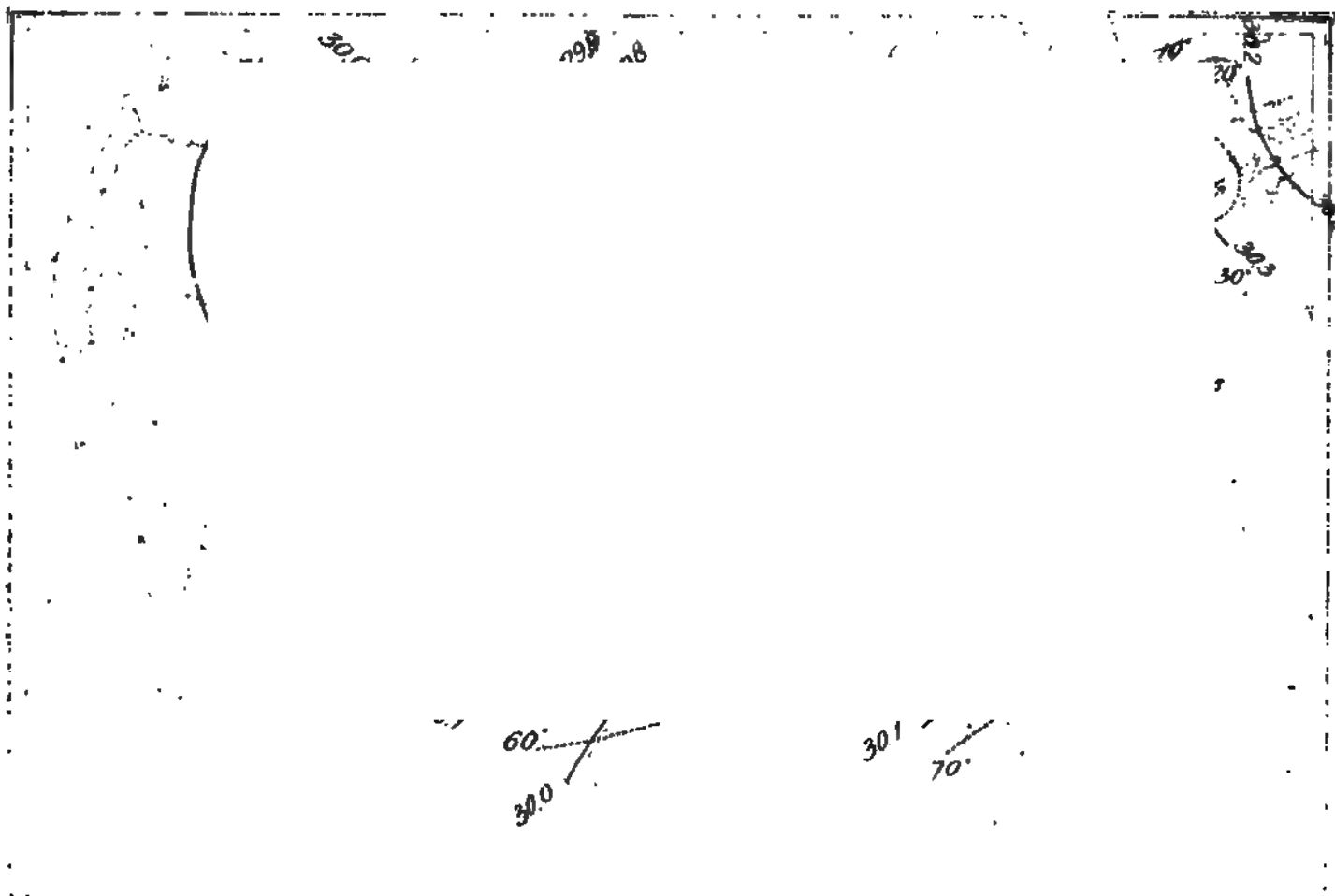


Chart OXXXIII.

February 18, 1898—8 a. m.

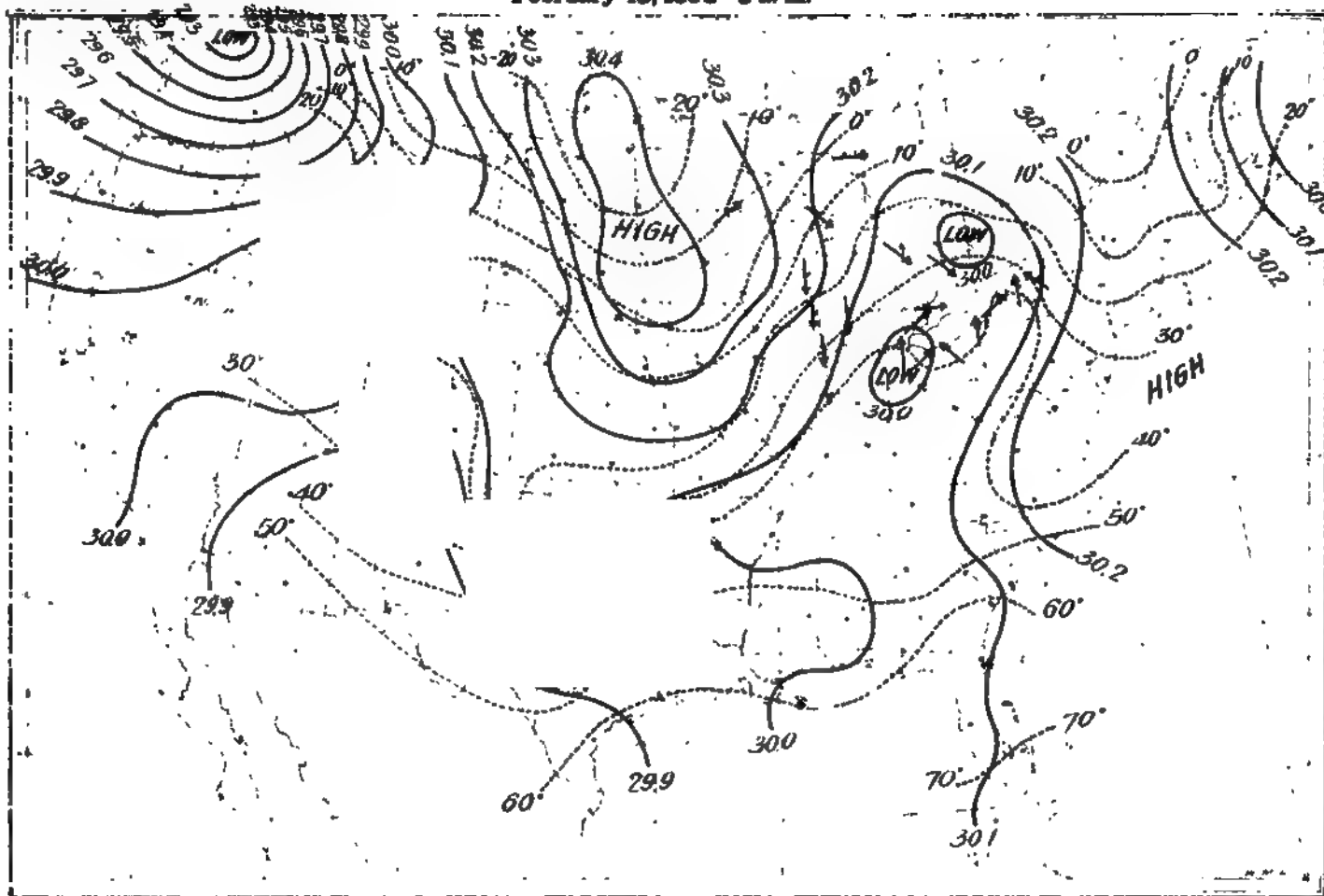


Chart OXXXIV.

February 18, 1898—8 p. m.

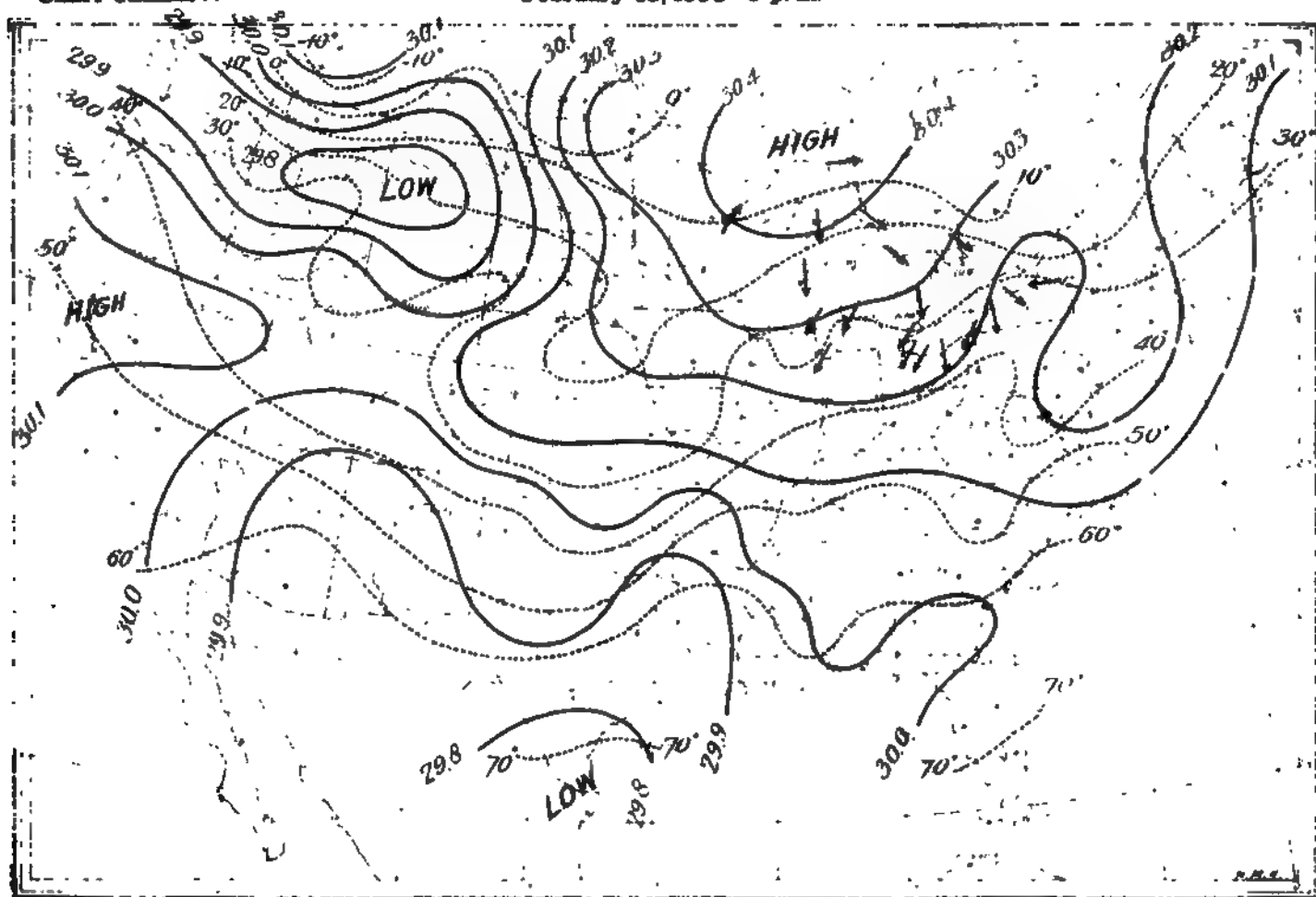


Chart CXXXV.

February 19, 1898—8 a. m.

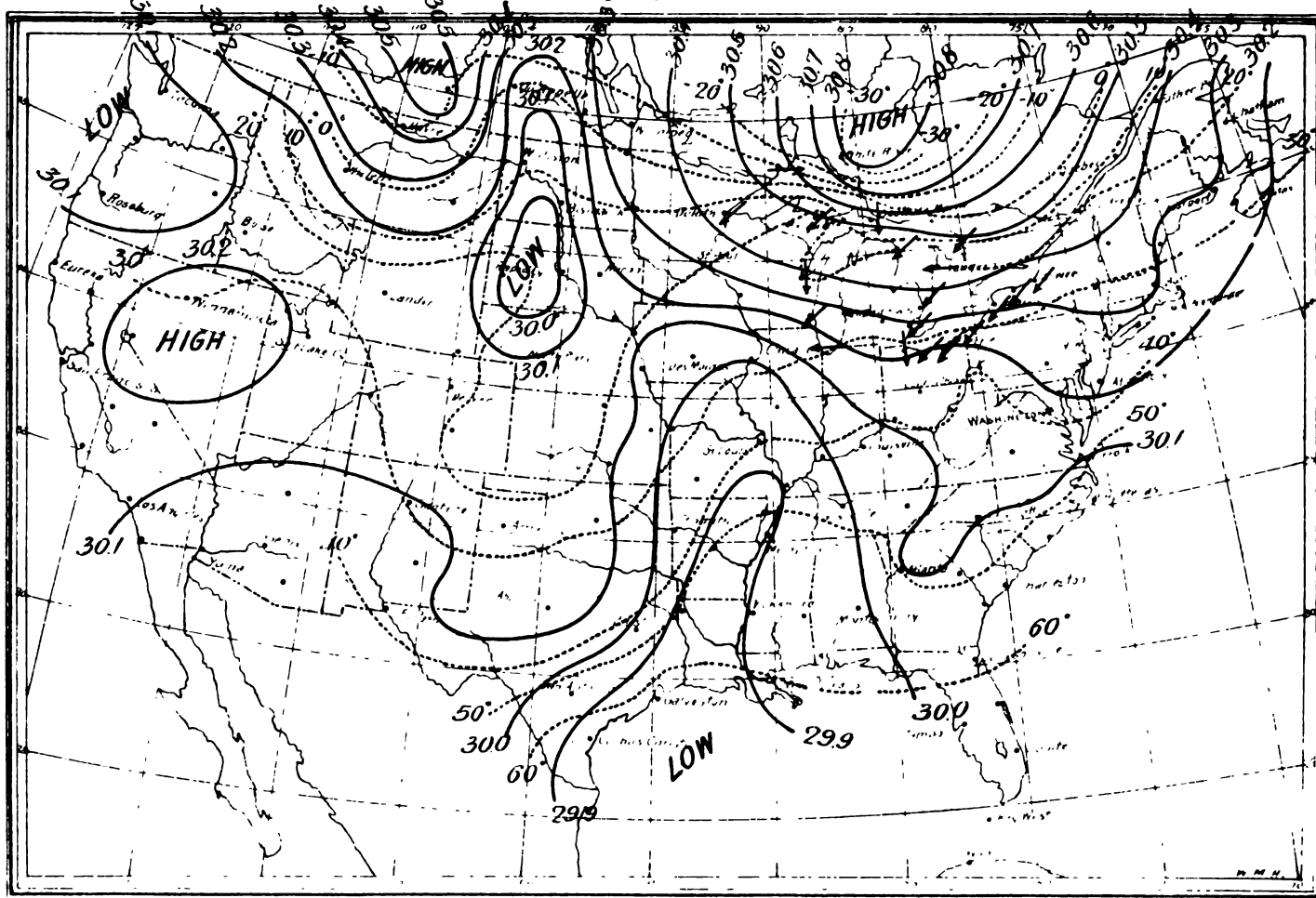


Chart CXXXVI.

February 19, 1898—8 p. m.

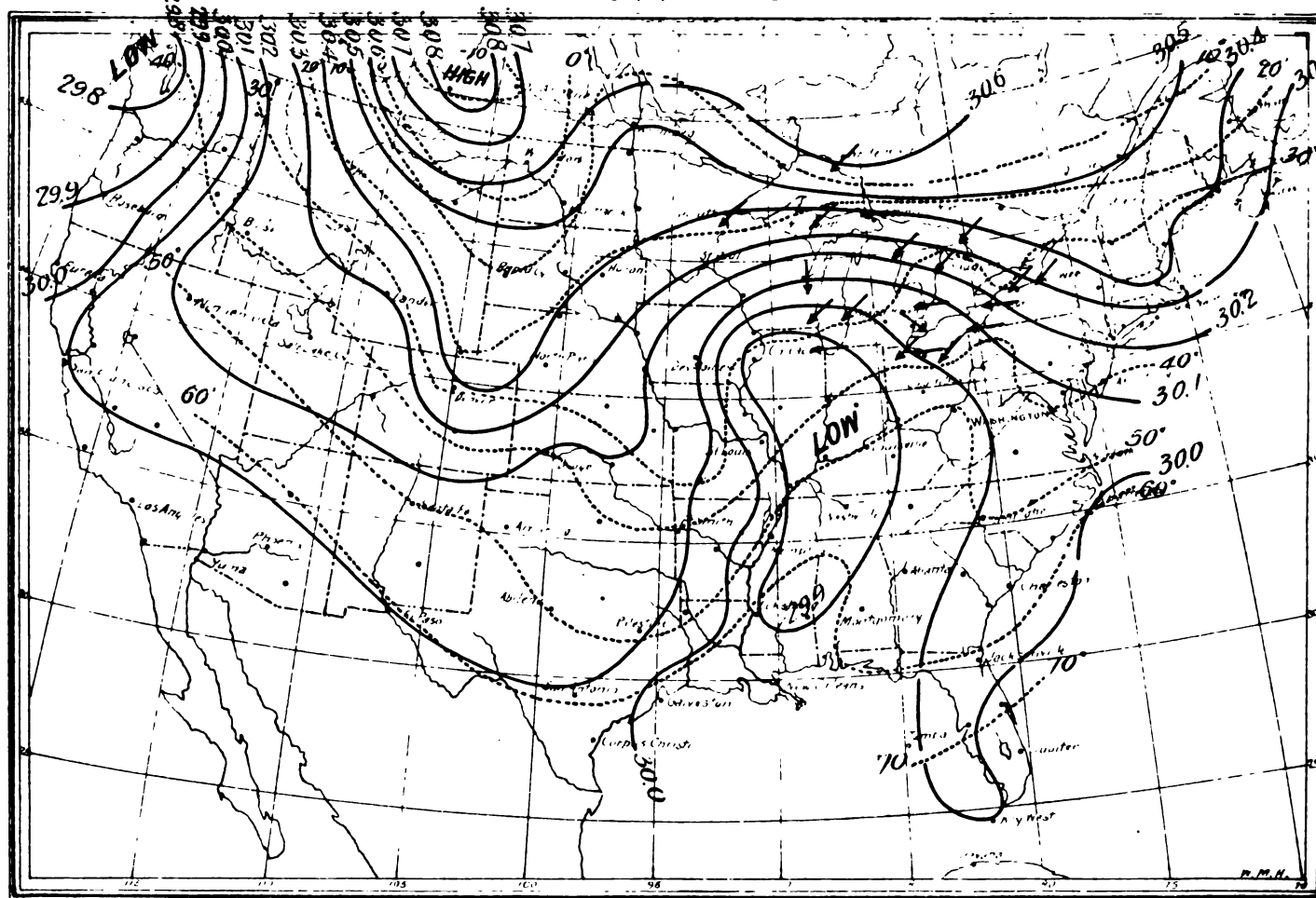


Chart OXXXVII.

March 15, 1876—7:35 a. m.

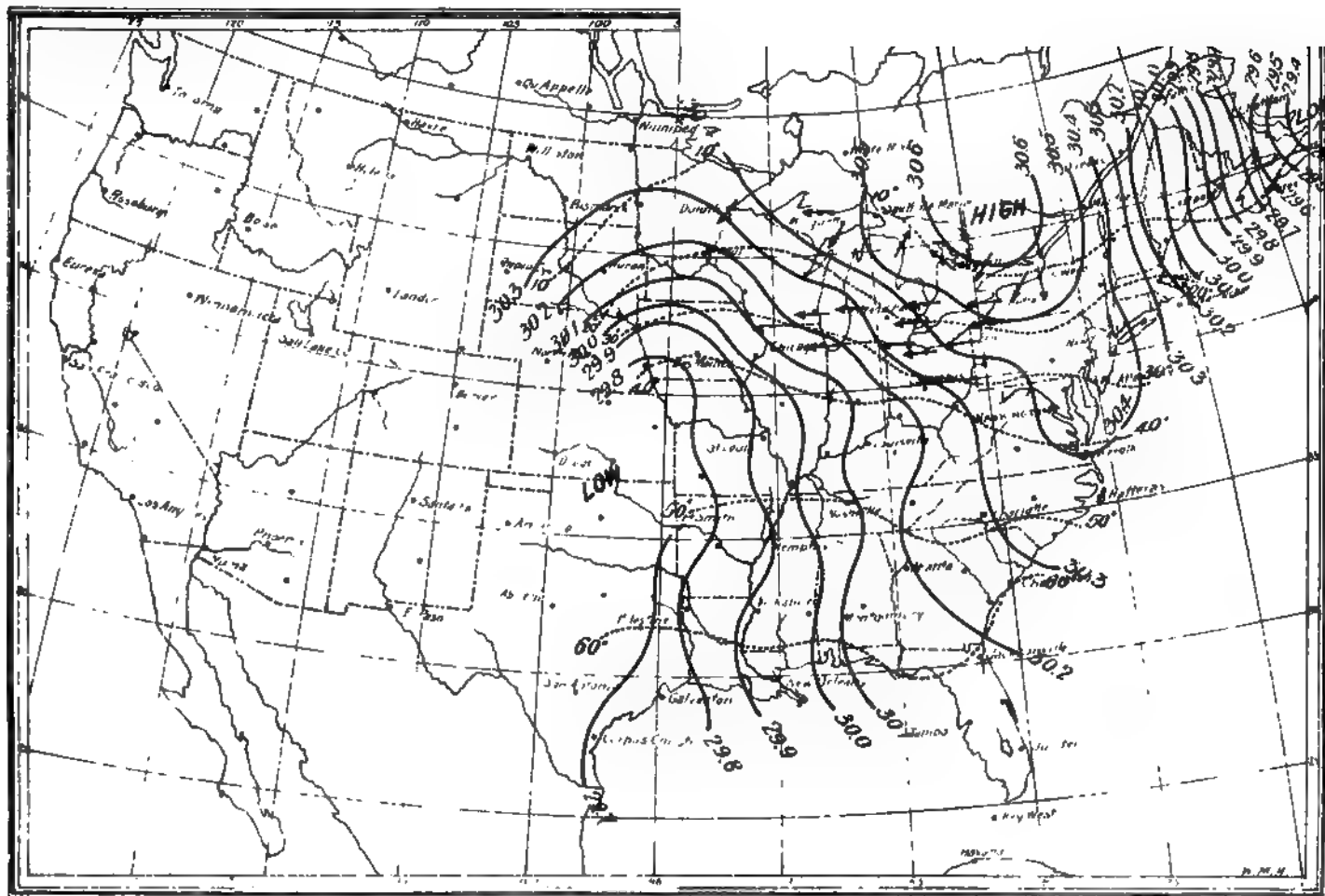


Chart OXXXVIII.

March 15, 1876—4:35 p. m.

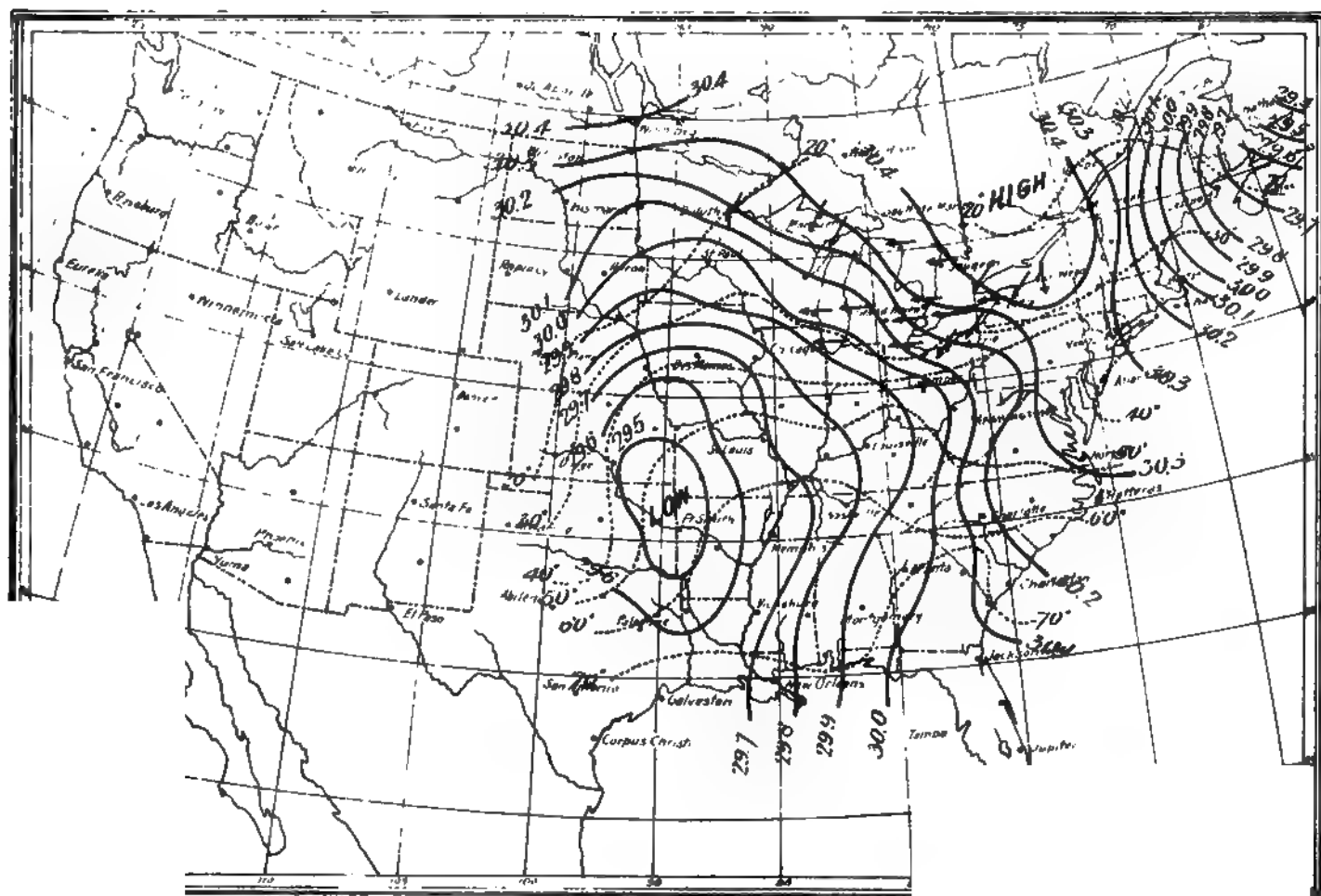


Chart OXXXIX.

March 16, 1876—7:35 a. m.

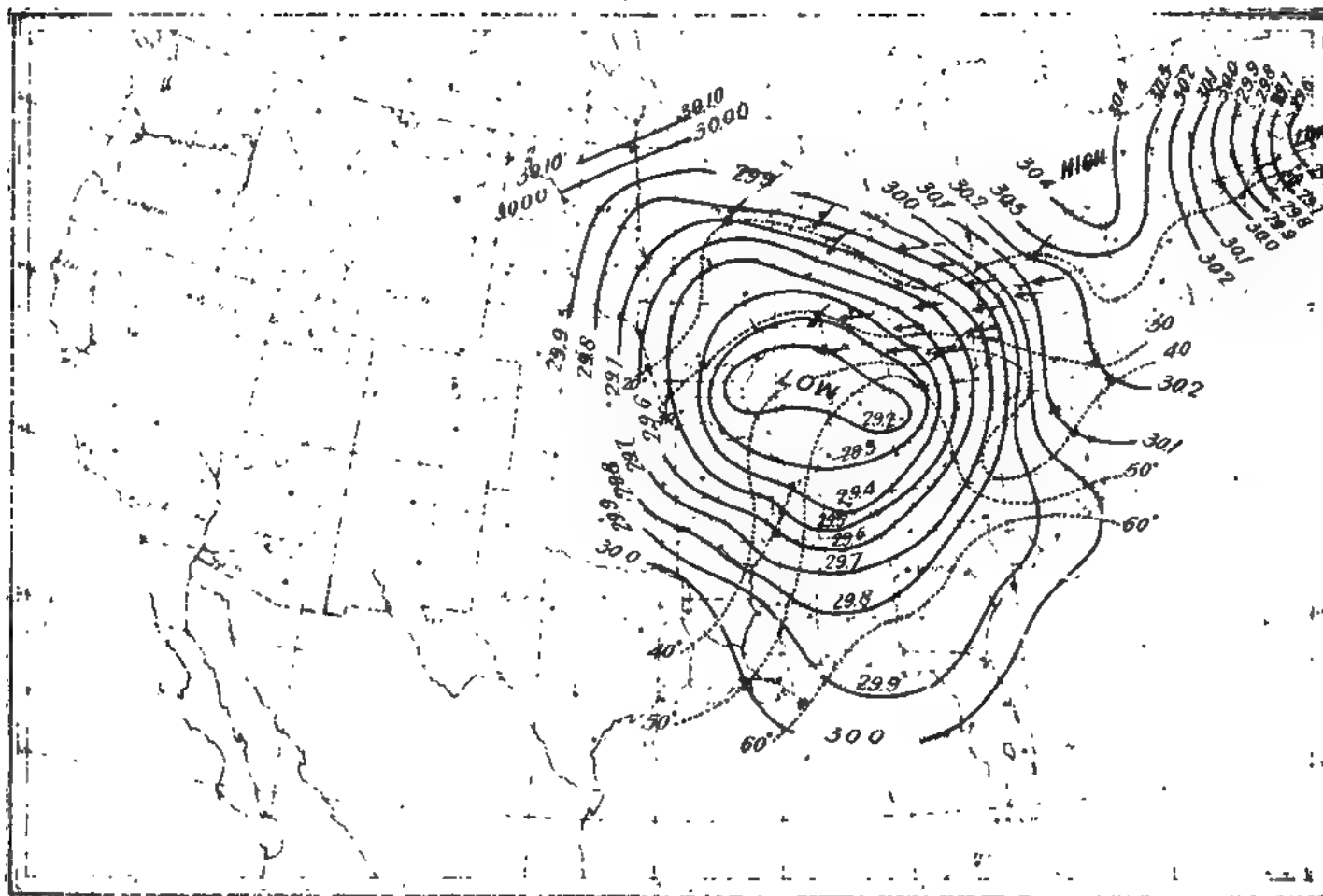


Chart OXL.

March 16, 1876—4:35 p. m.

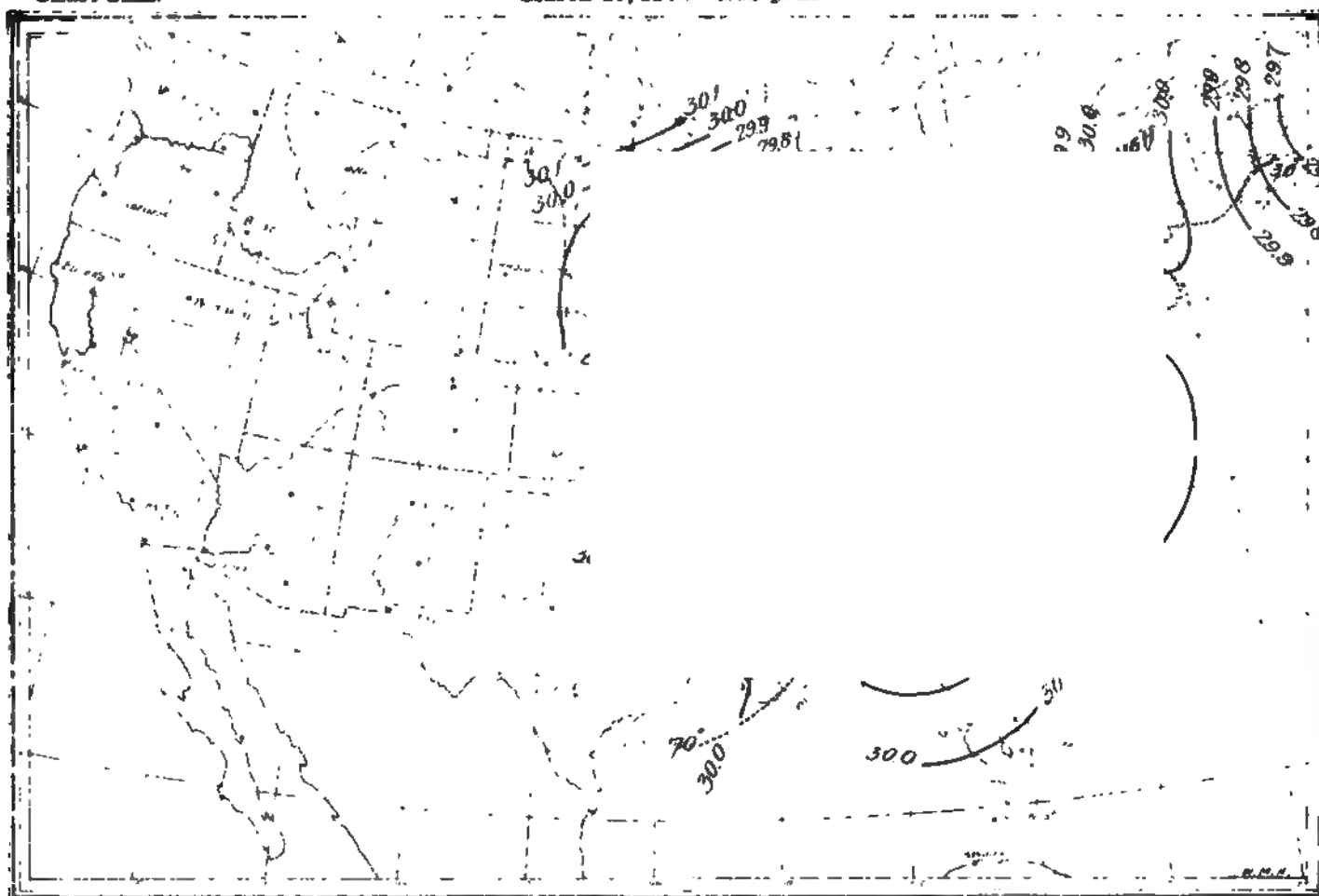


Chart OXLI.

March 24, 1876—7:35 a. m.

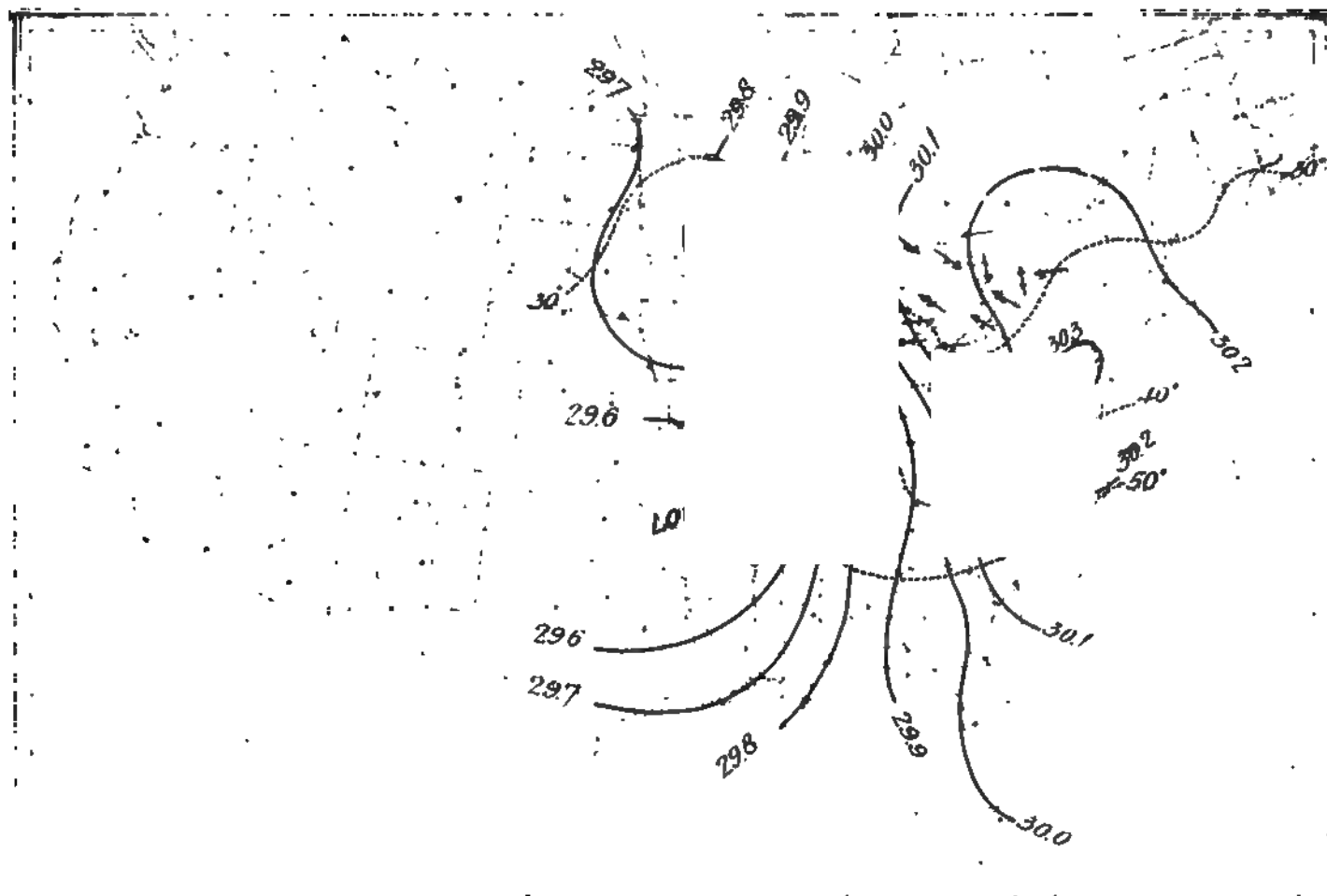


Chart OXLII.

March 24, 1876—4:35 p. m.

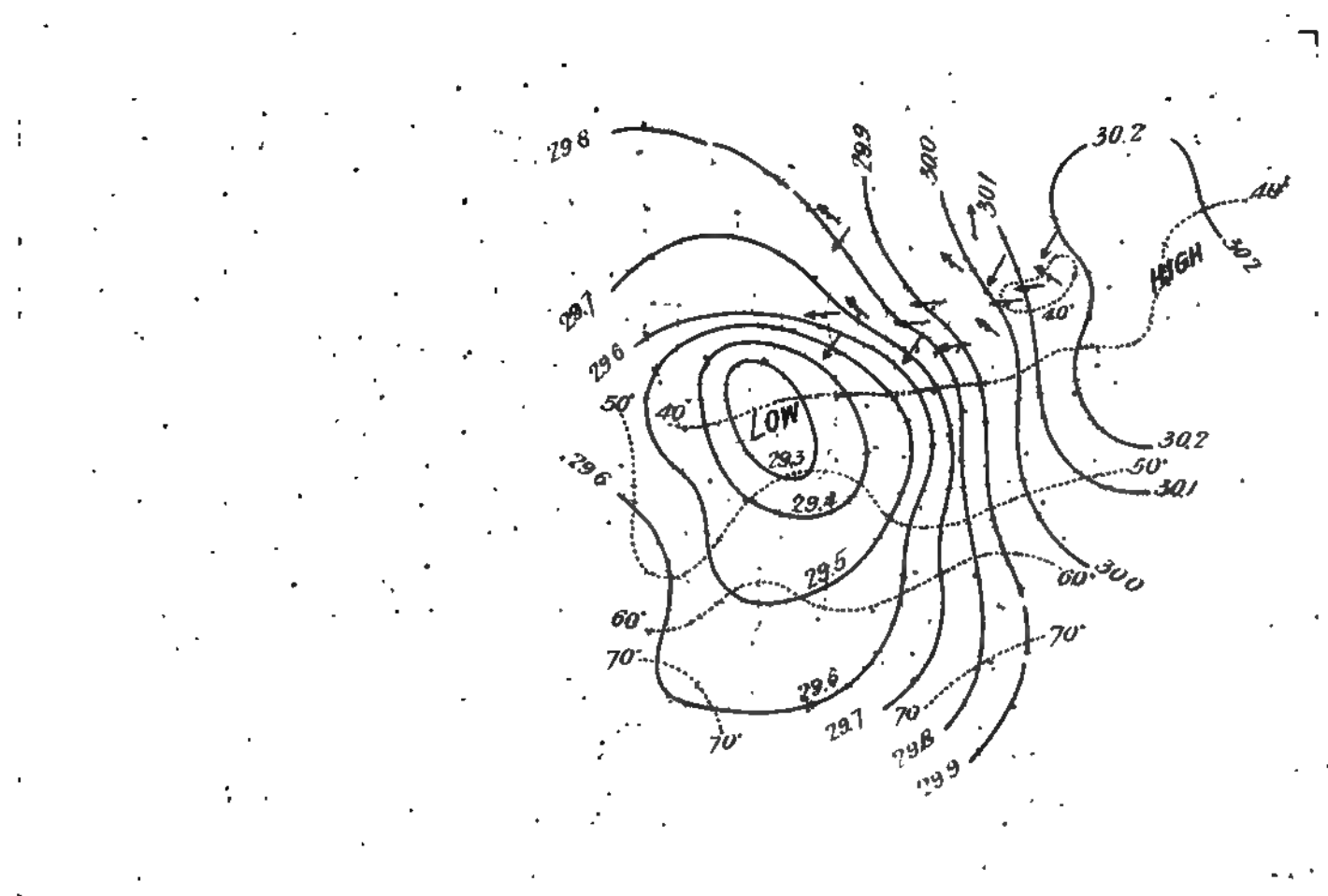


Chart OXLV.

March 1, 1877—7:35 a. m.

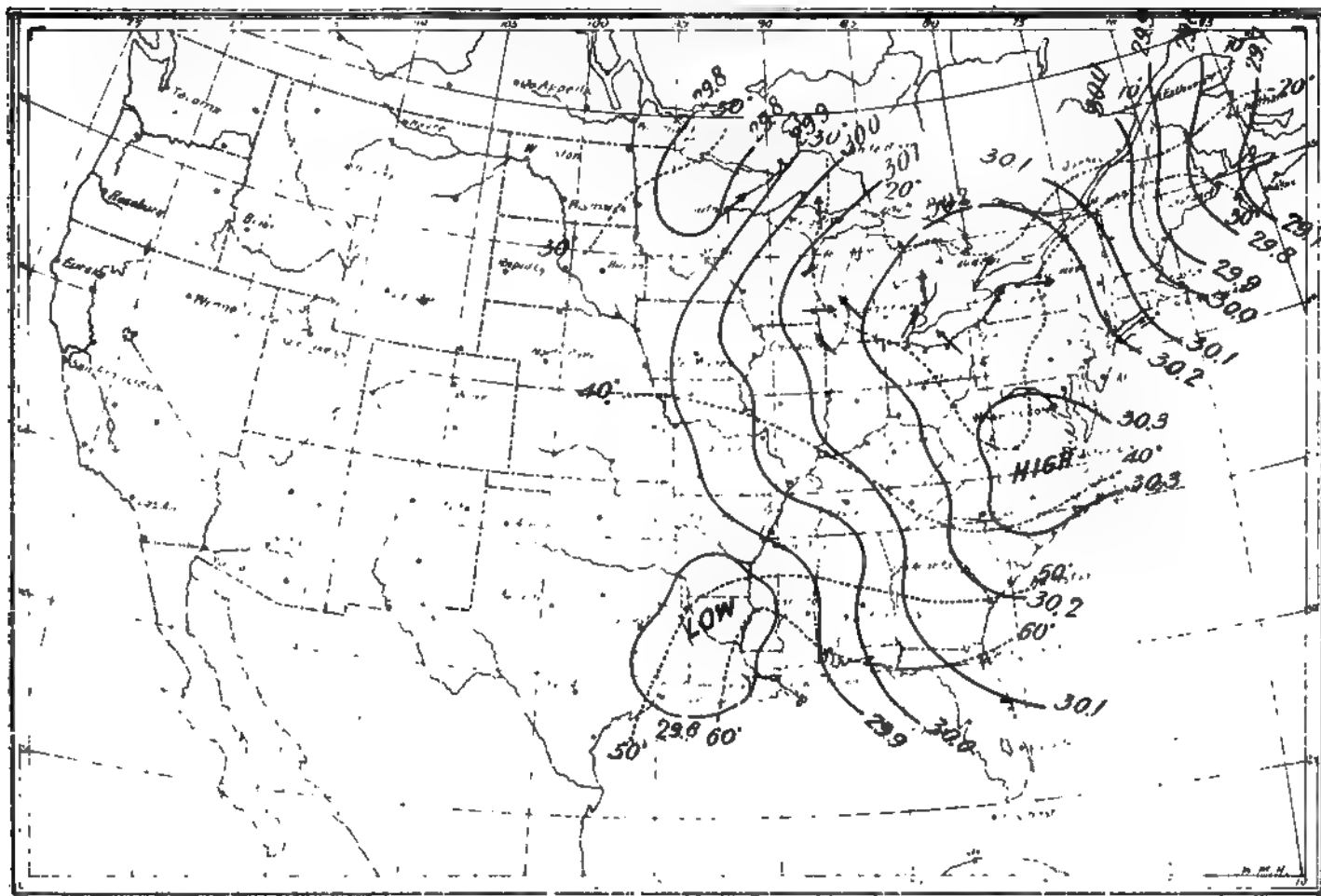


Chart OXLVI.

March 1, 1877—4:35 p. m.

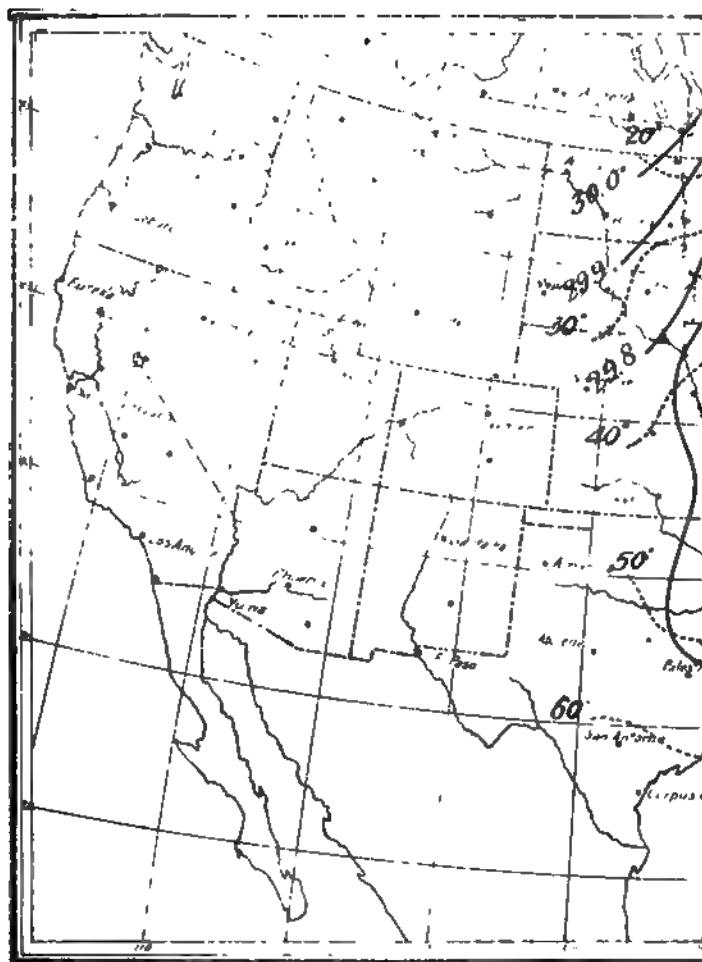


Chart OXLVII.

March 2, 1877—7:35 a. m.

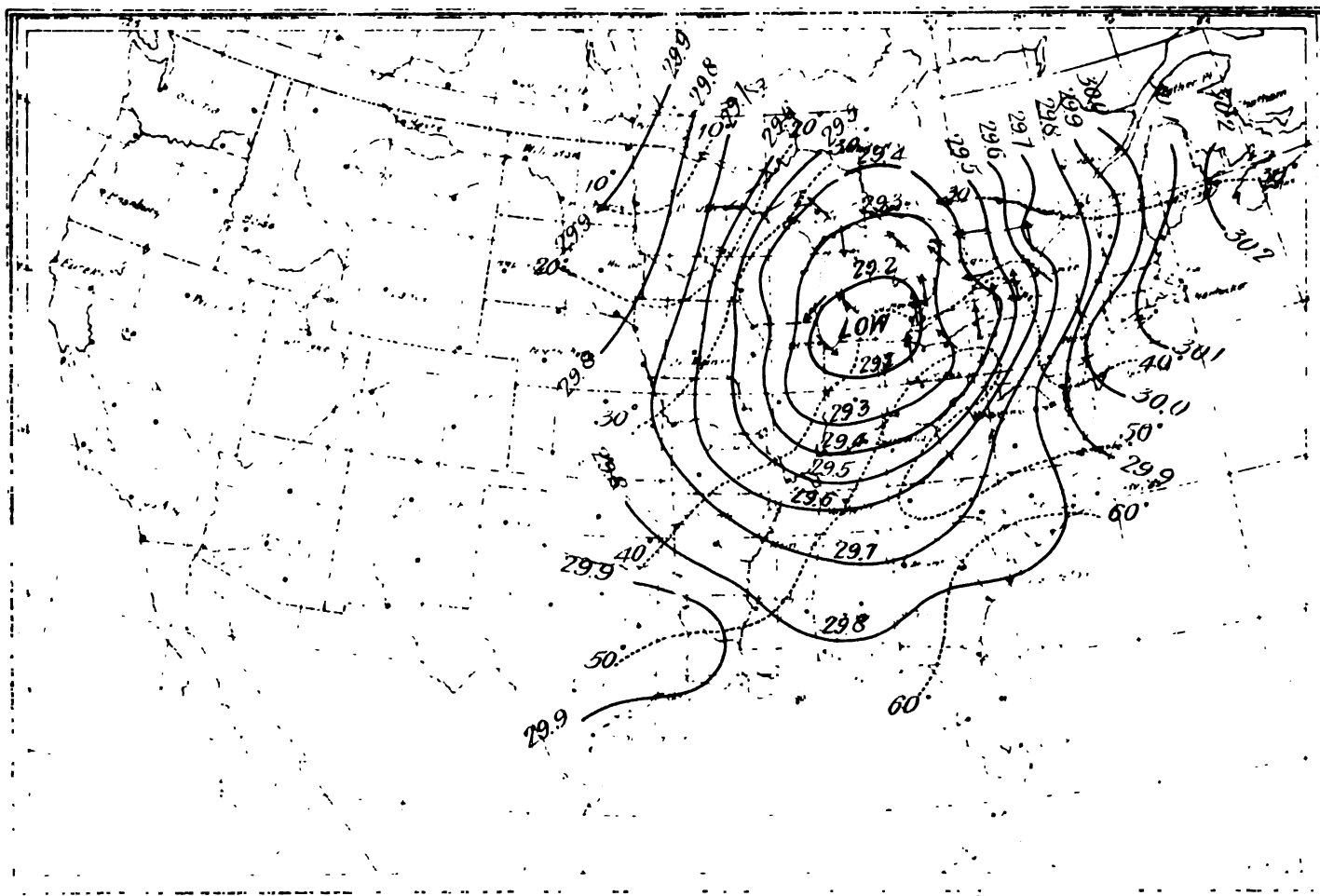


Chart OXLVIII.

March 2, 1877—4:35 p. m.

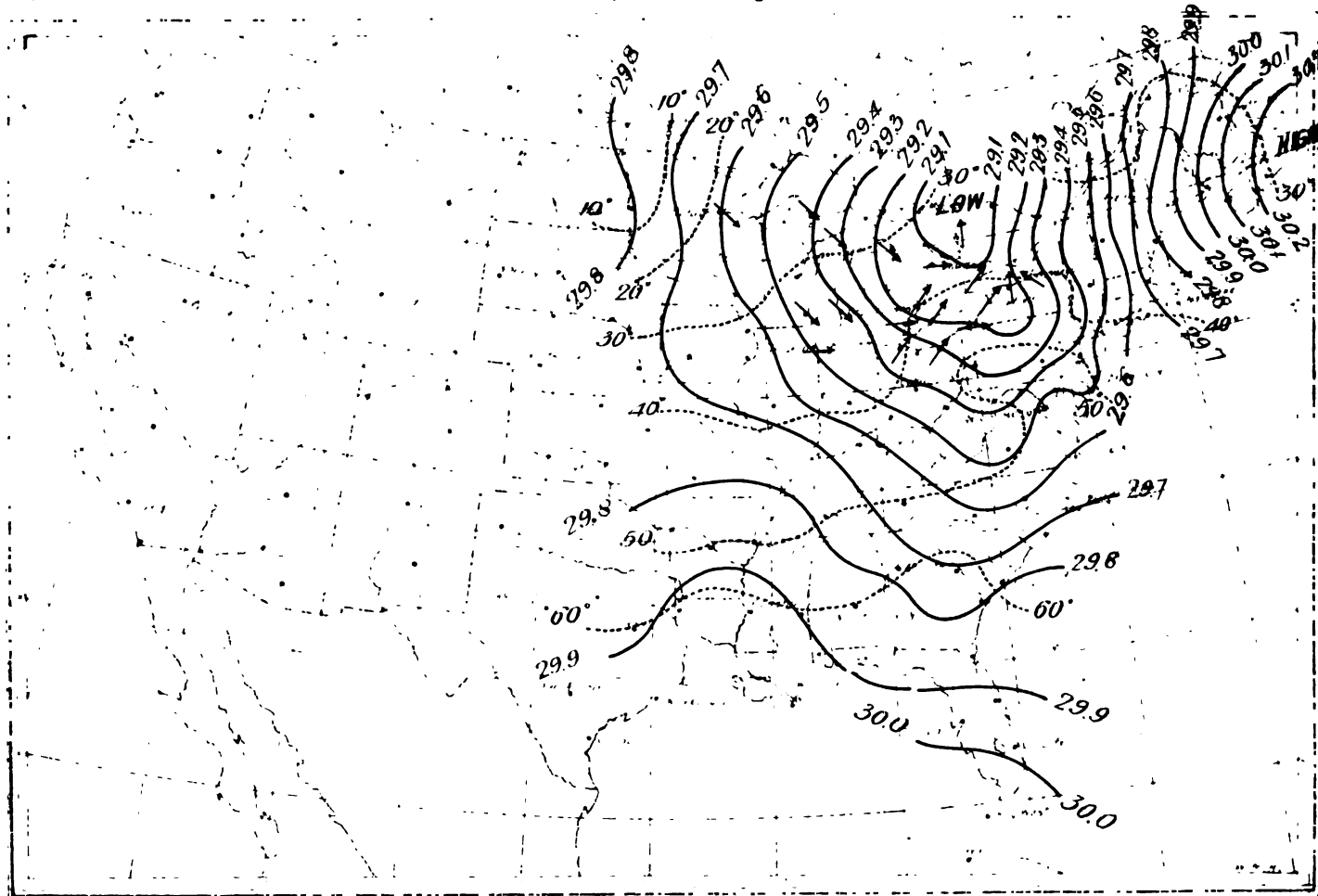


Chart CXLIX.

March 2, 1878—7:35 a. m.

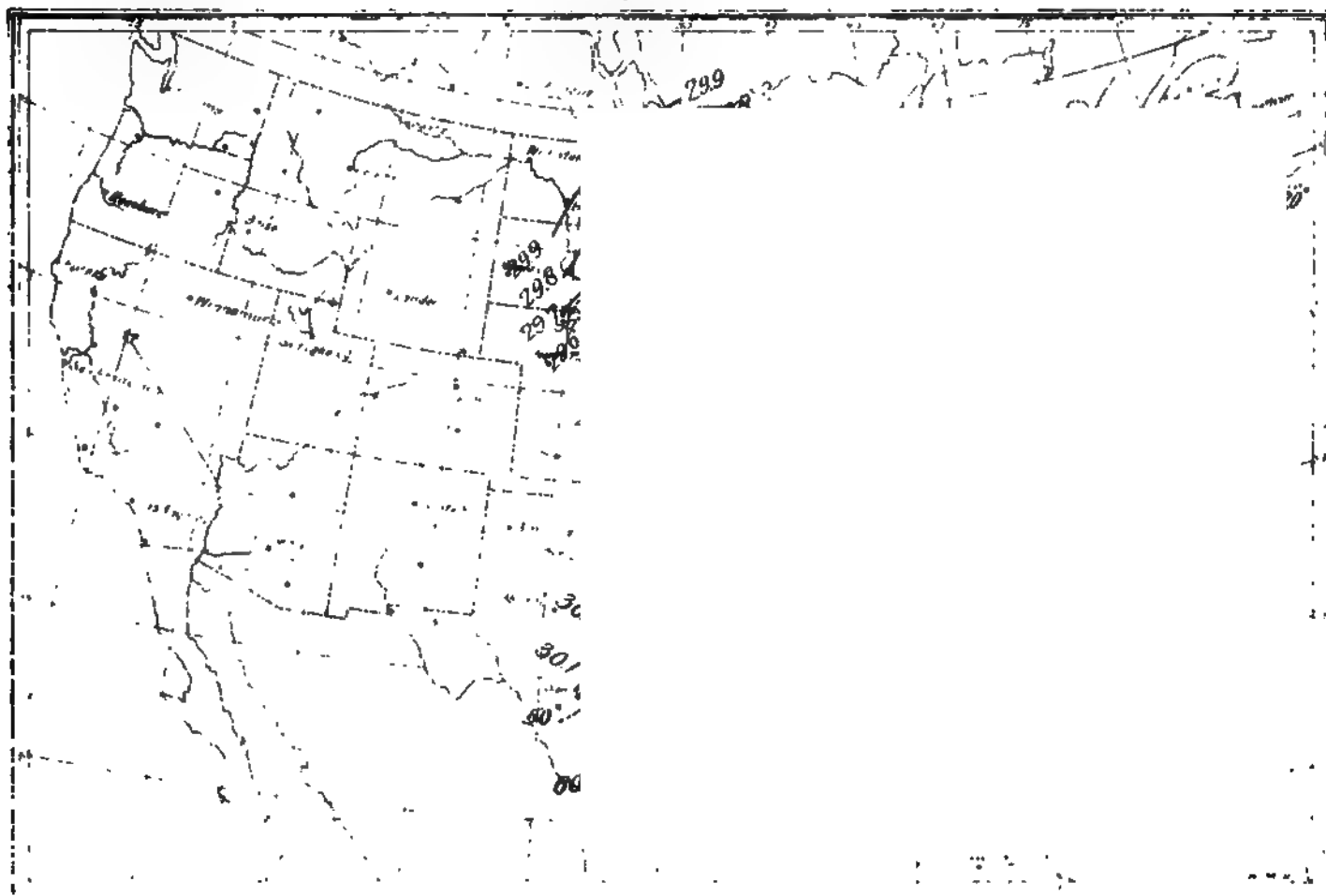


Chart CL.

March 2, 1878—4:35 p. m.

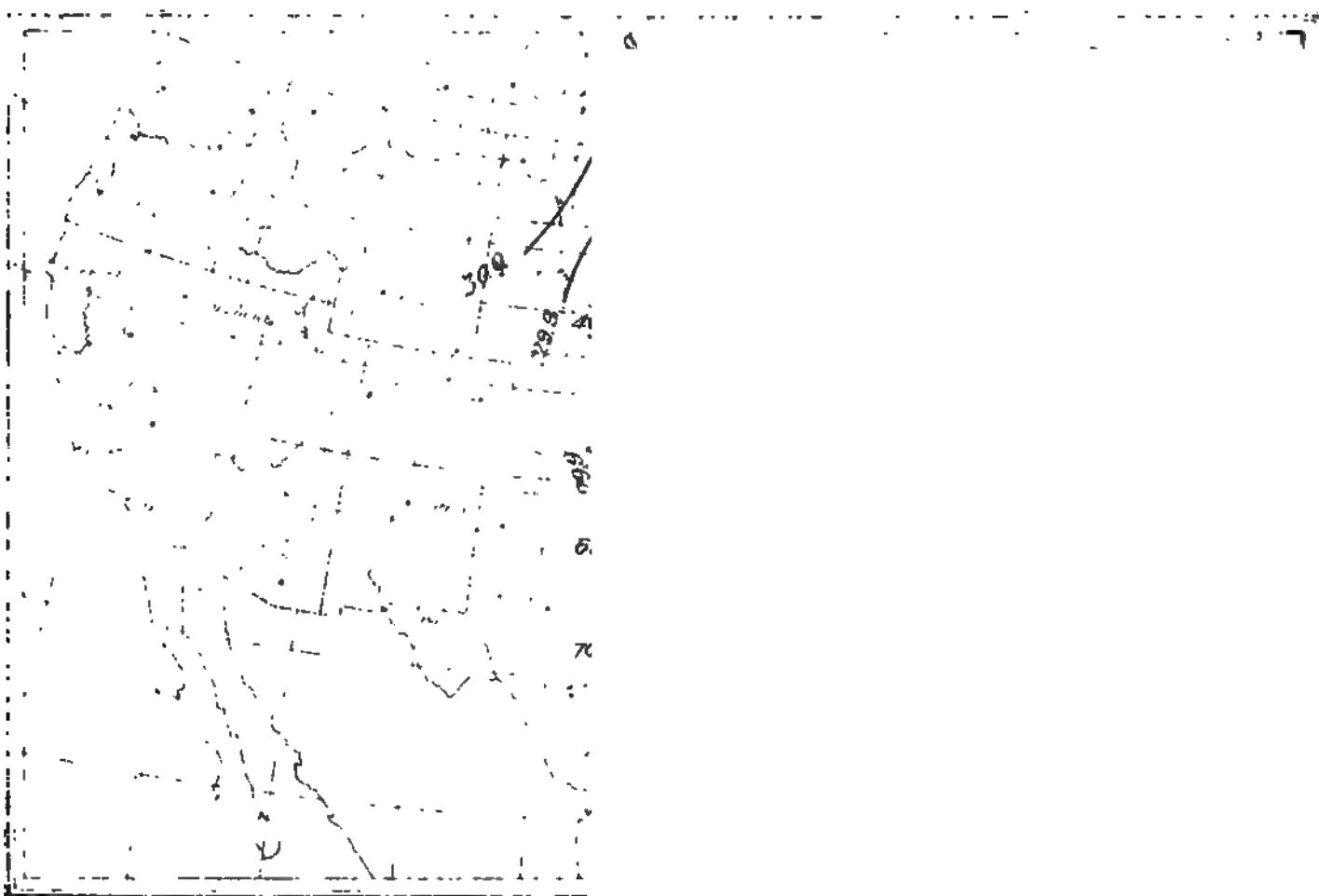


Chart OLI

March 3, 1878—7:35 a. m.

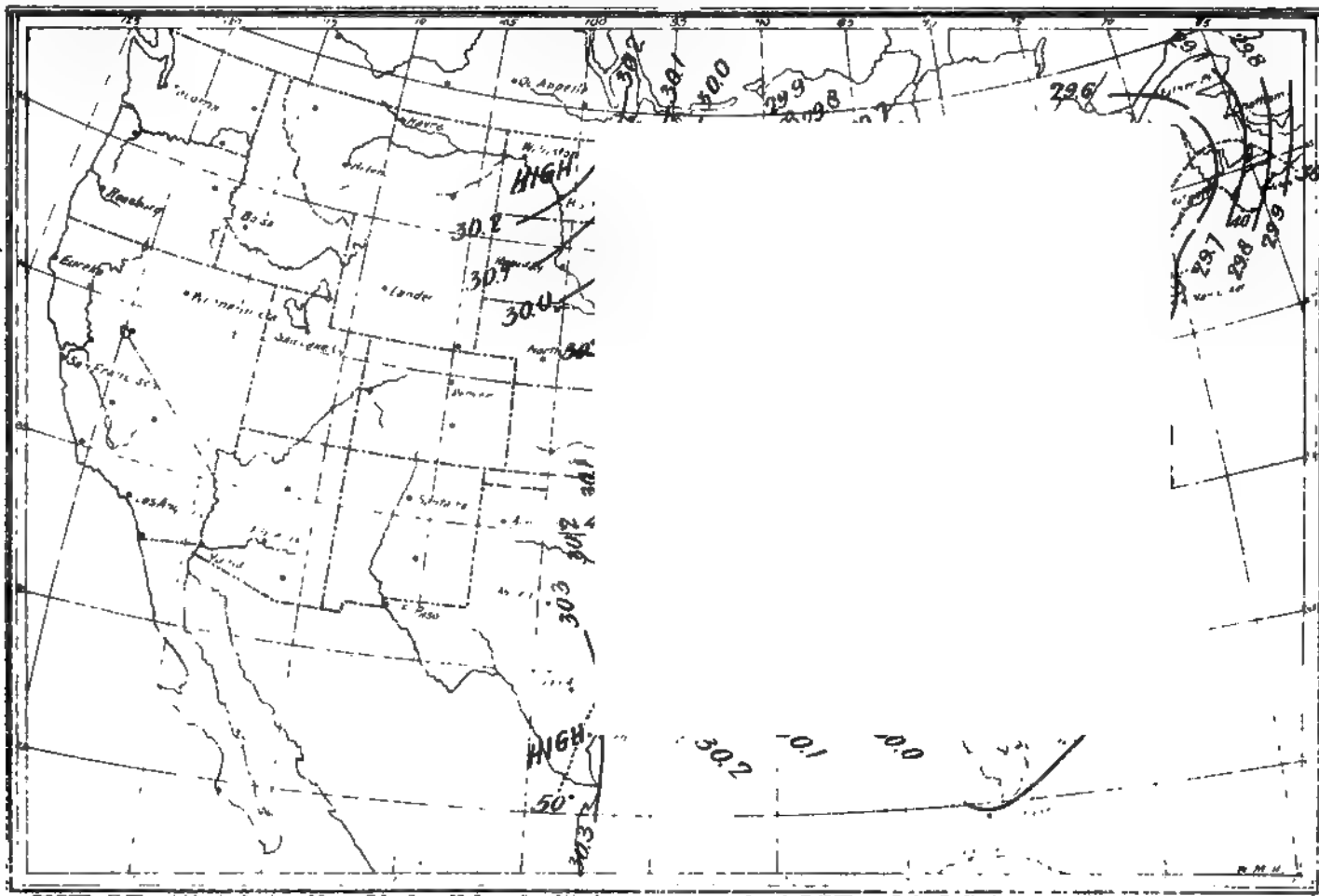
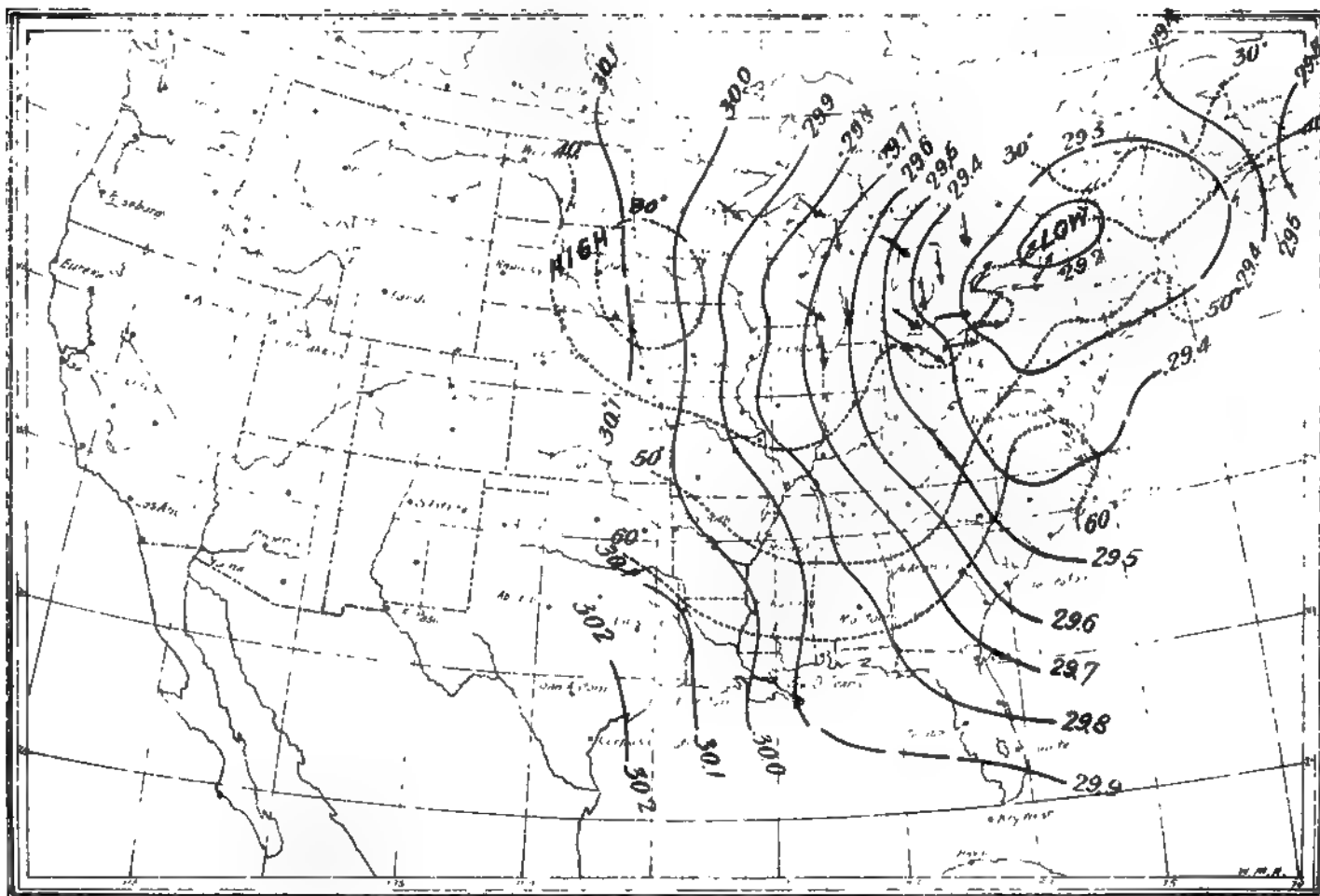


Chart OLI

March 3, 1878—4:35 p. m.



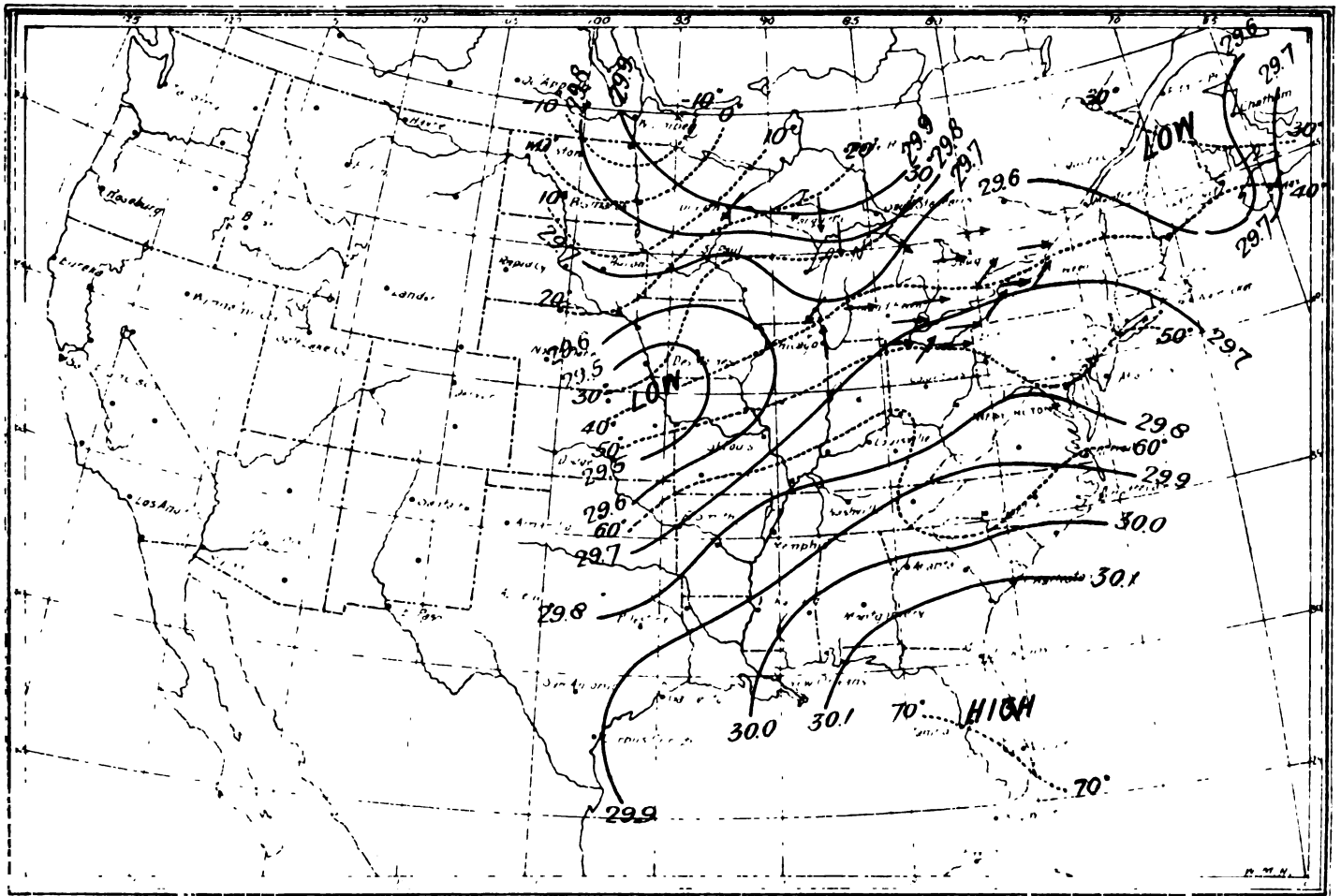


Chart OLIV.

March 4, 1880—3 p. m.

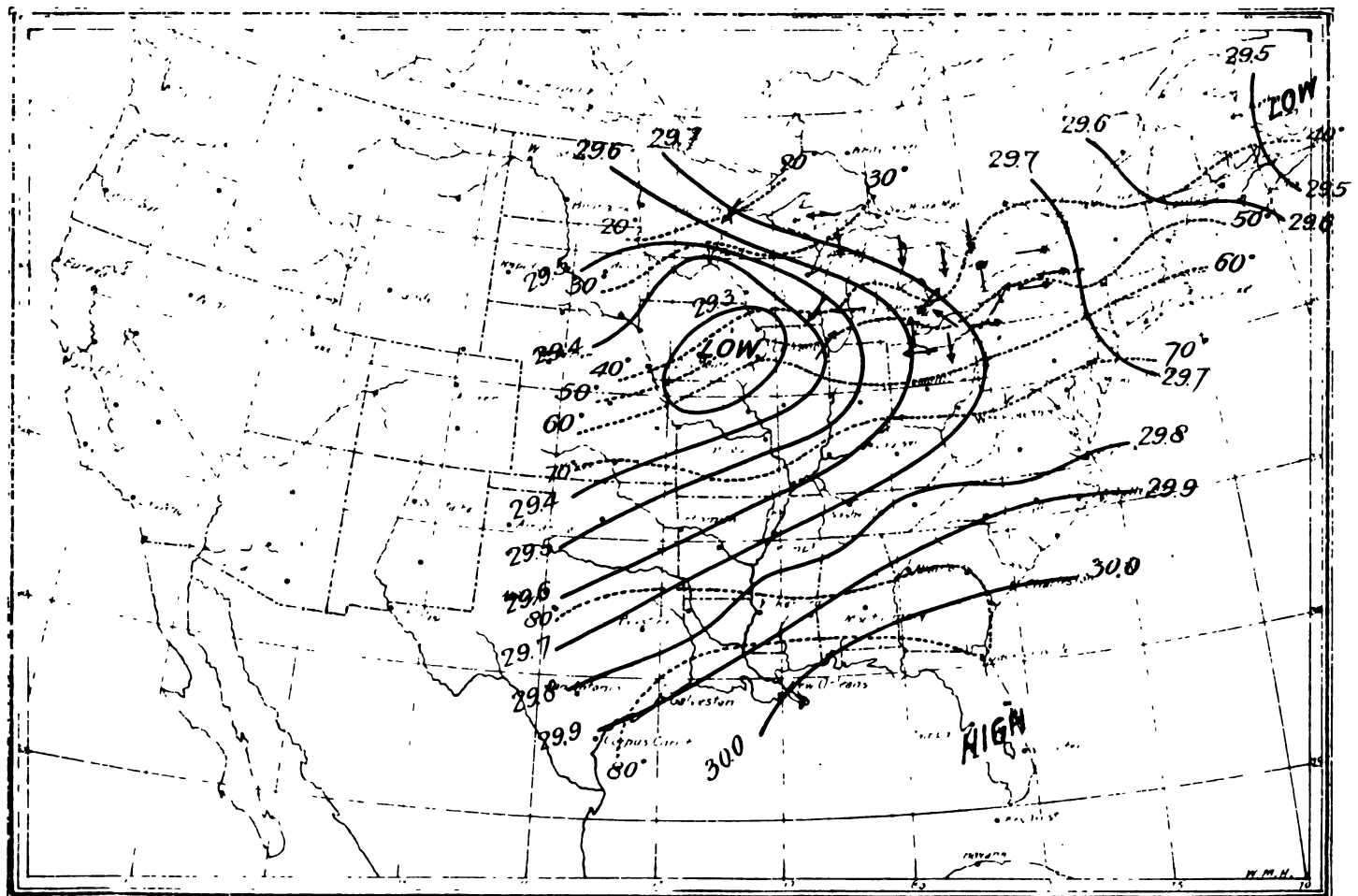


Chart OL.V.

March 5, 1880—7 a. m.

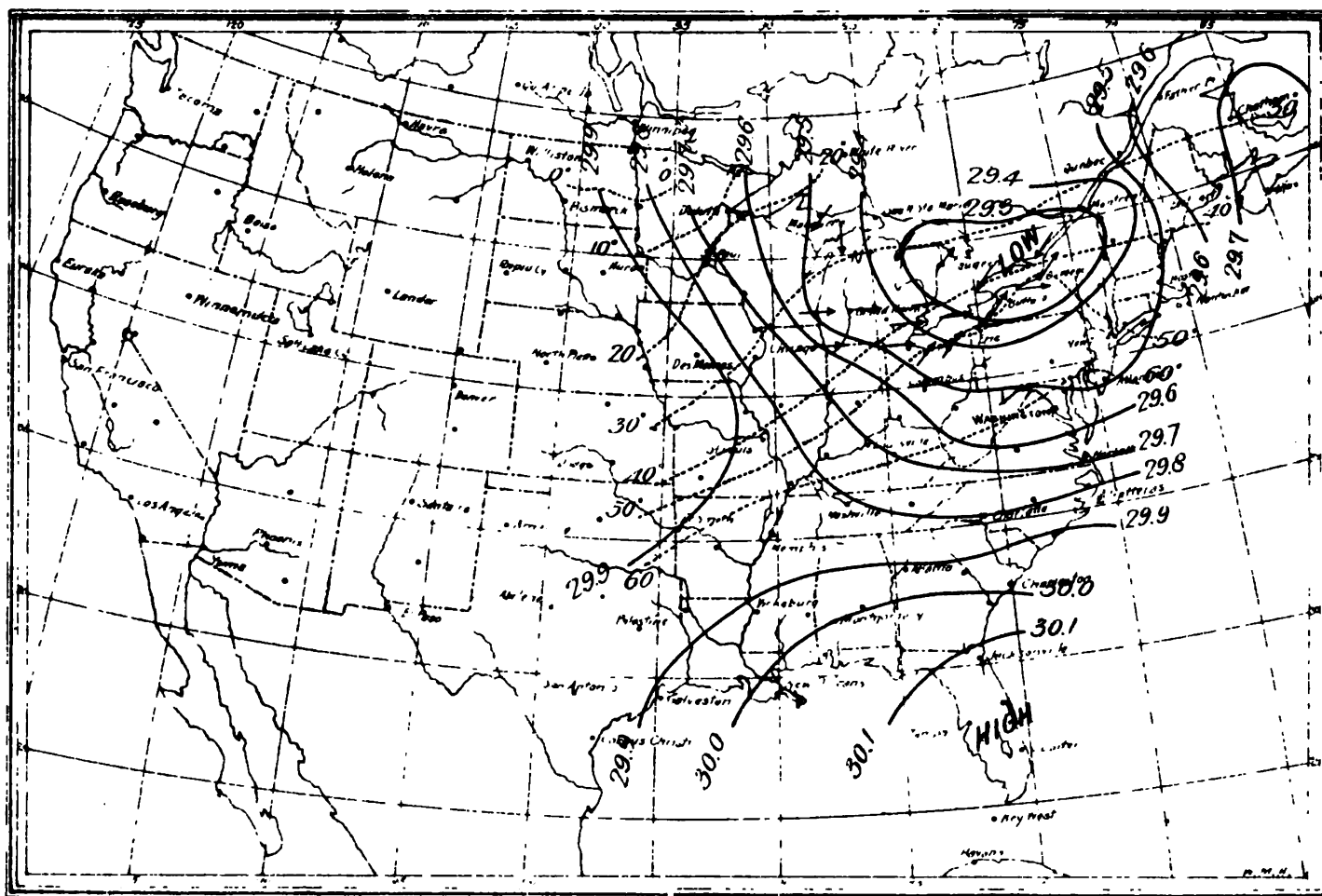


Chart OL.VI.

March 5, 1880—3 p. m.

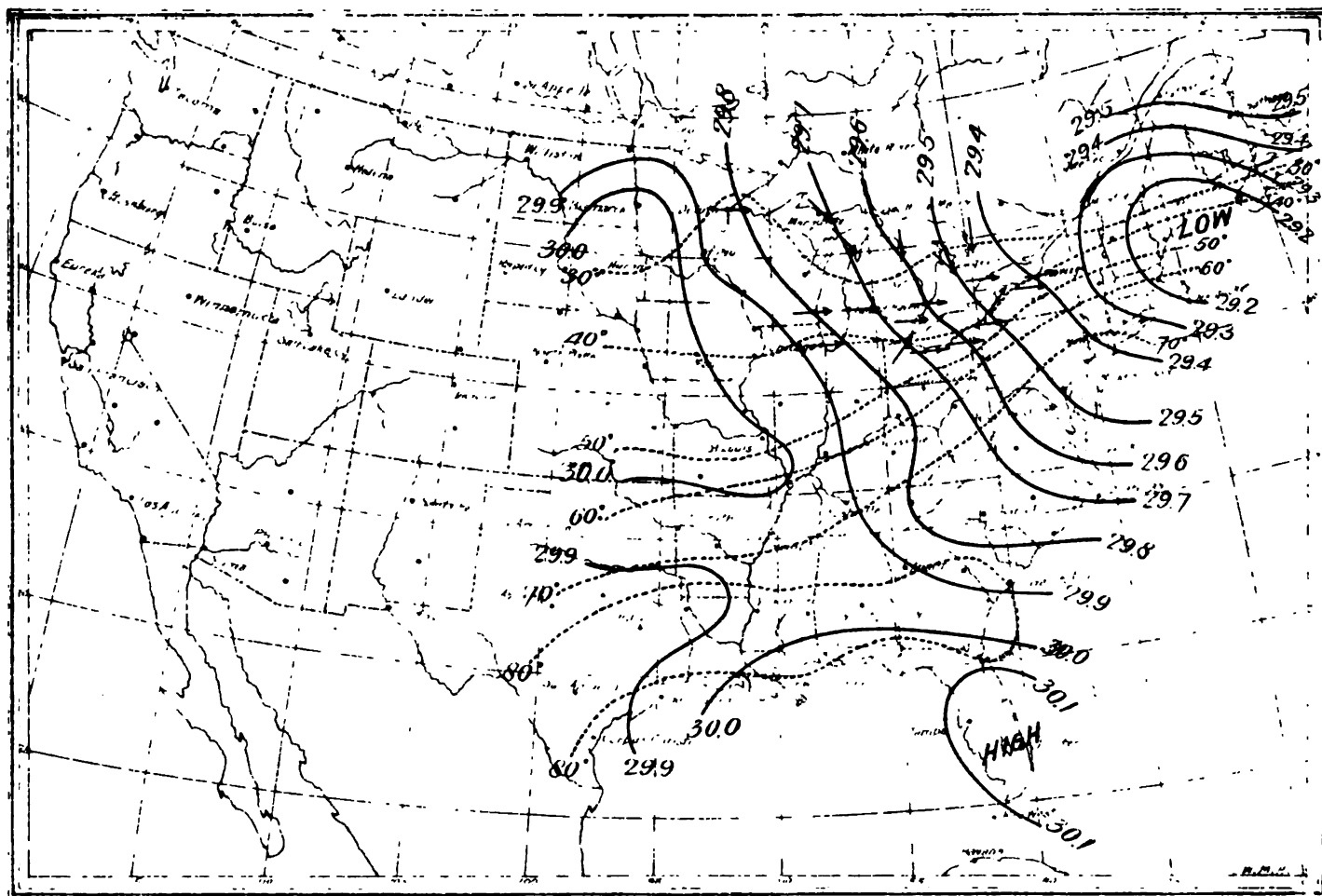


Chart OL VII.

March 26, 1880—7 a. m.



Chart OL VIII.

March 26, 1880—8 p. m.

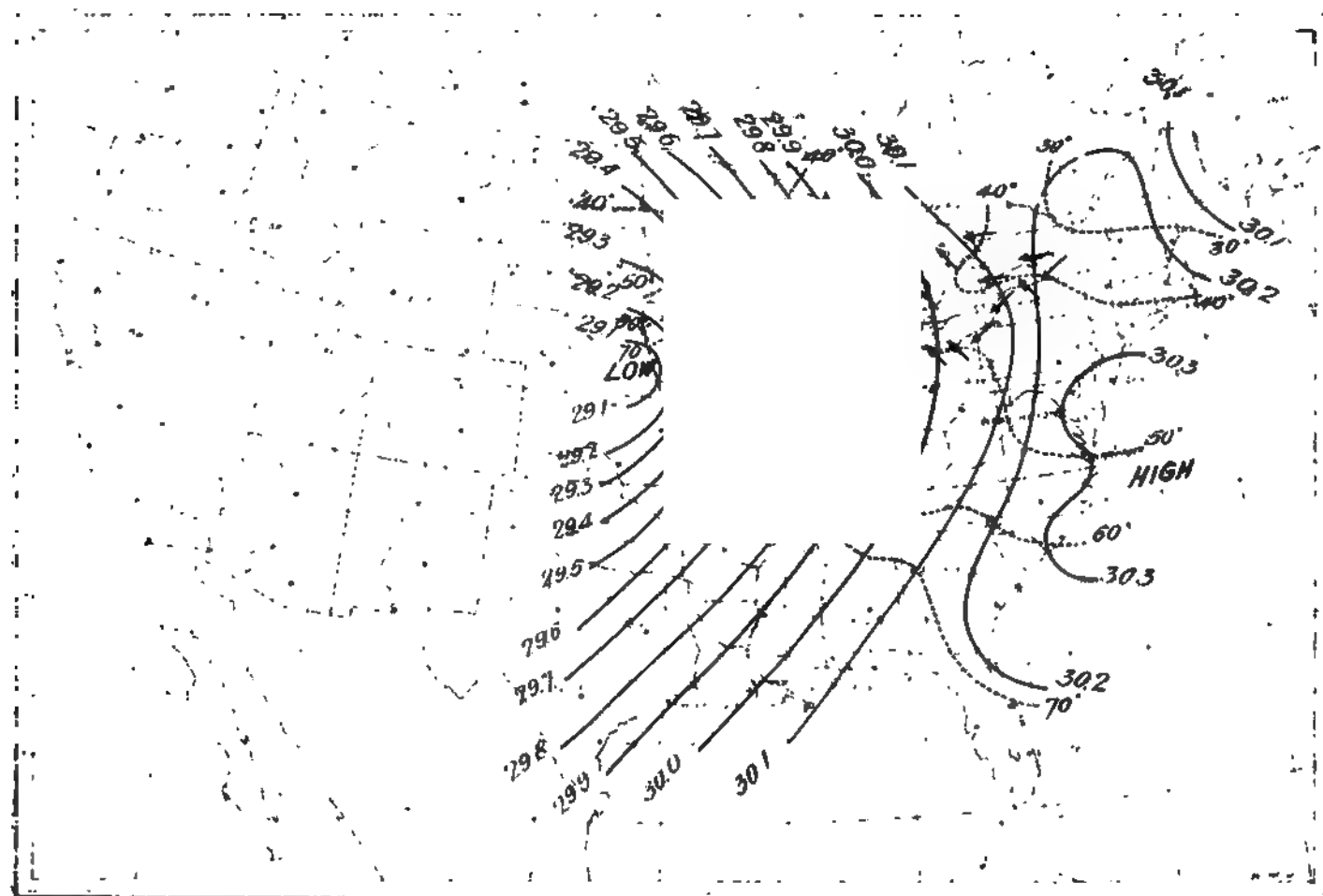


Chart OLIX.

March 27, 1880—7 a. m.

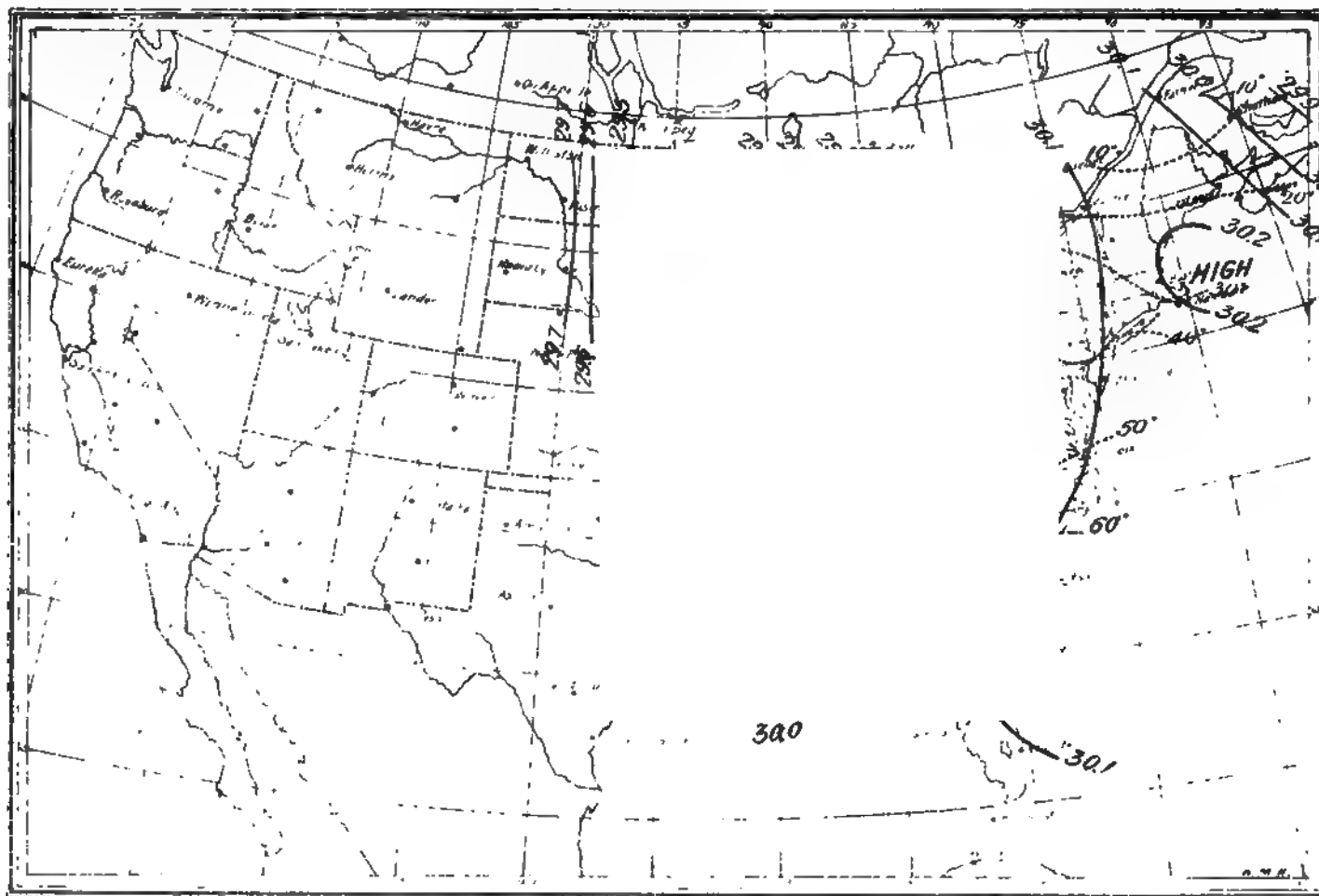


Chart OLIX.

March 27, 1880—3 p. m.

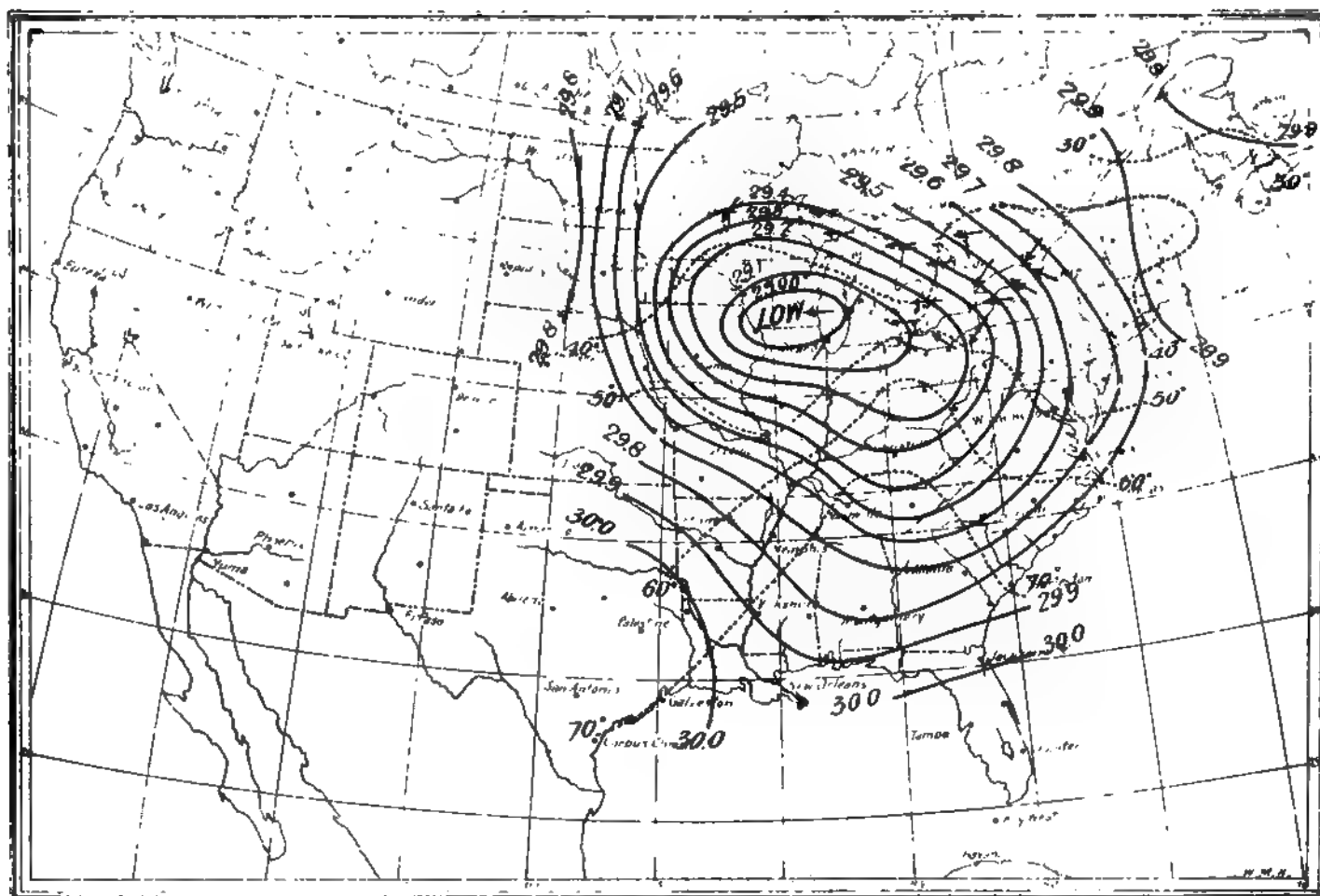


Chart OLCXI.

March 18, 1881—7 a. m.

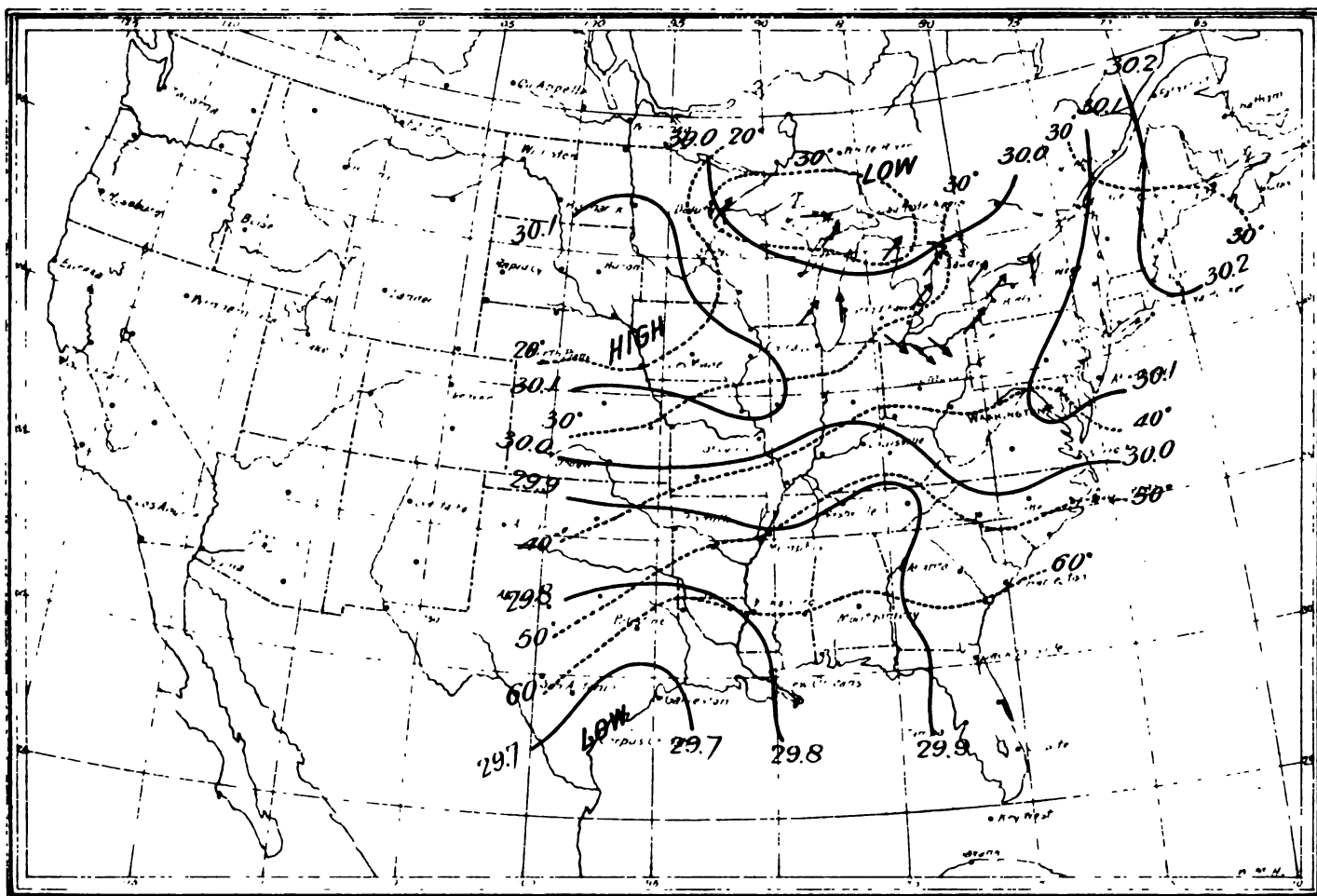


Chart OLCXII.

March 18, 1881—3 p. m.

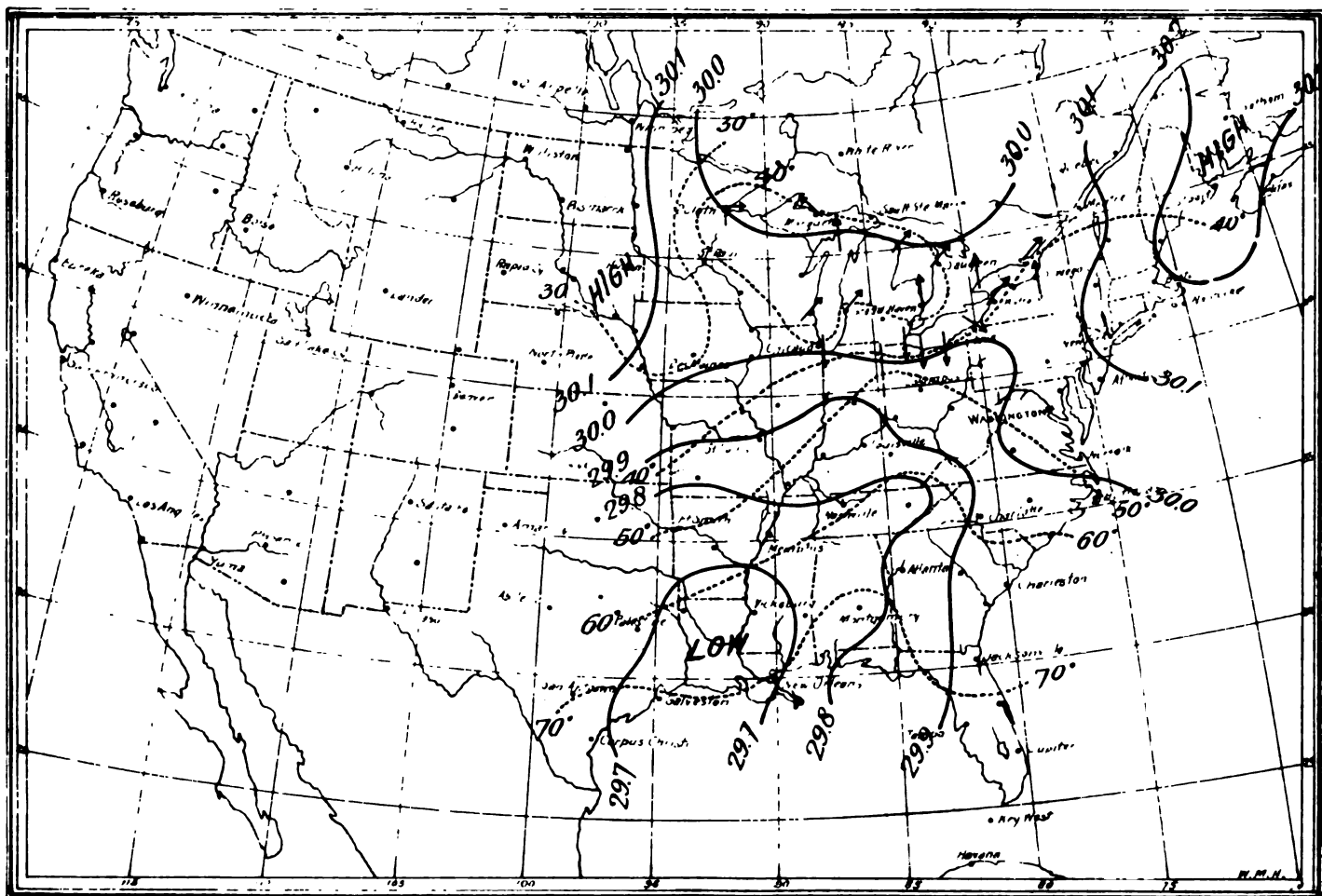


Chart CLXIII.

March 19, 1881—7 a. m.

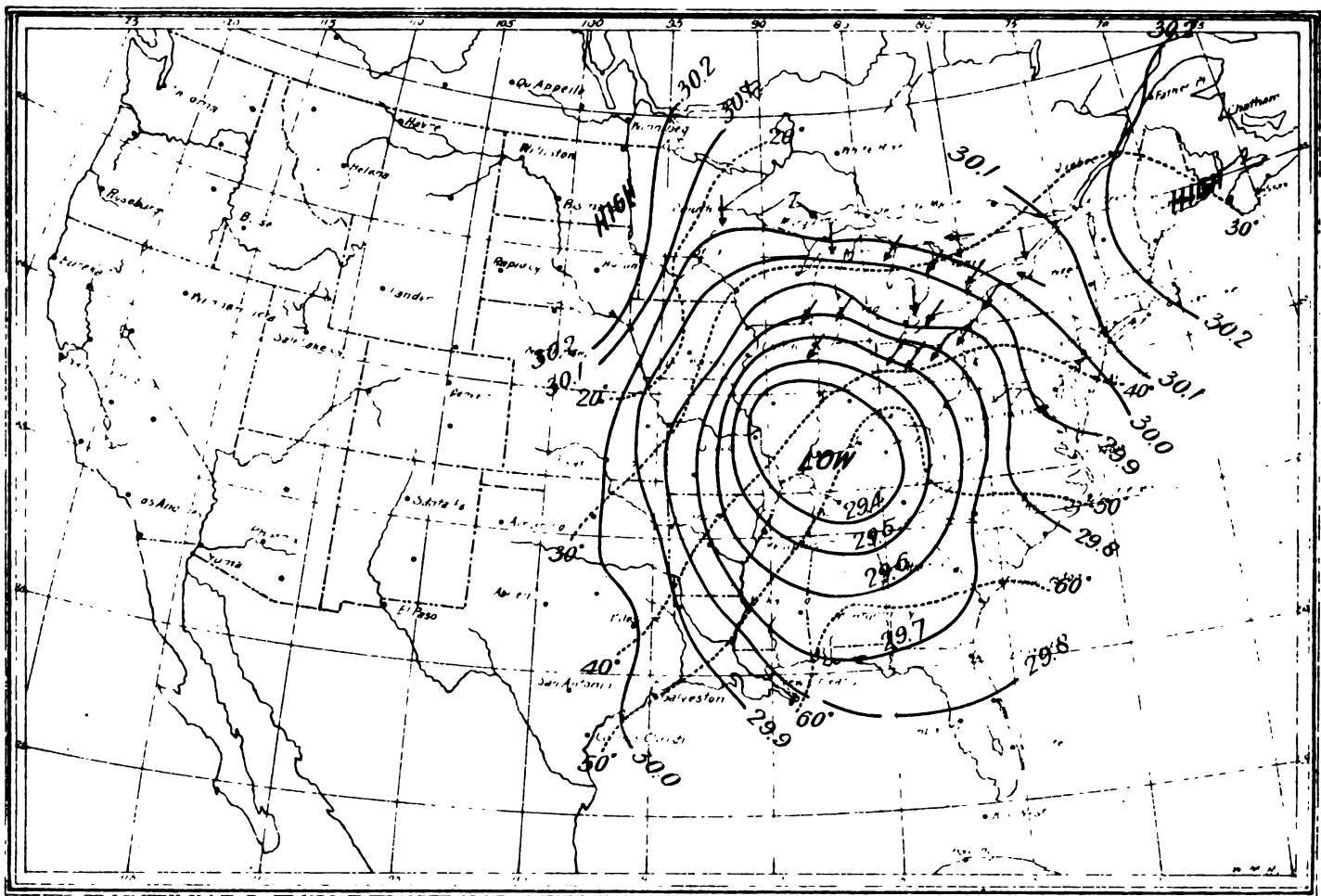
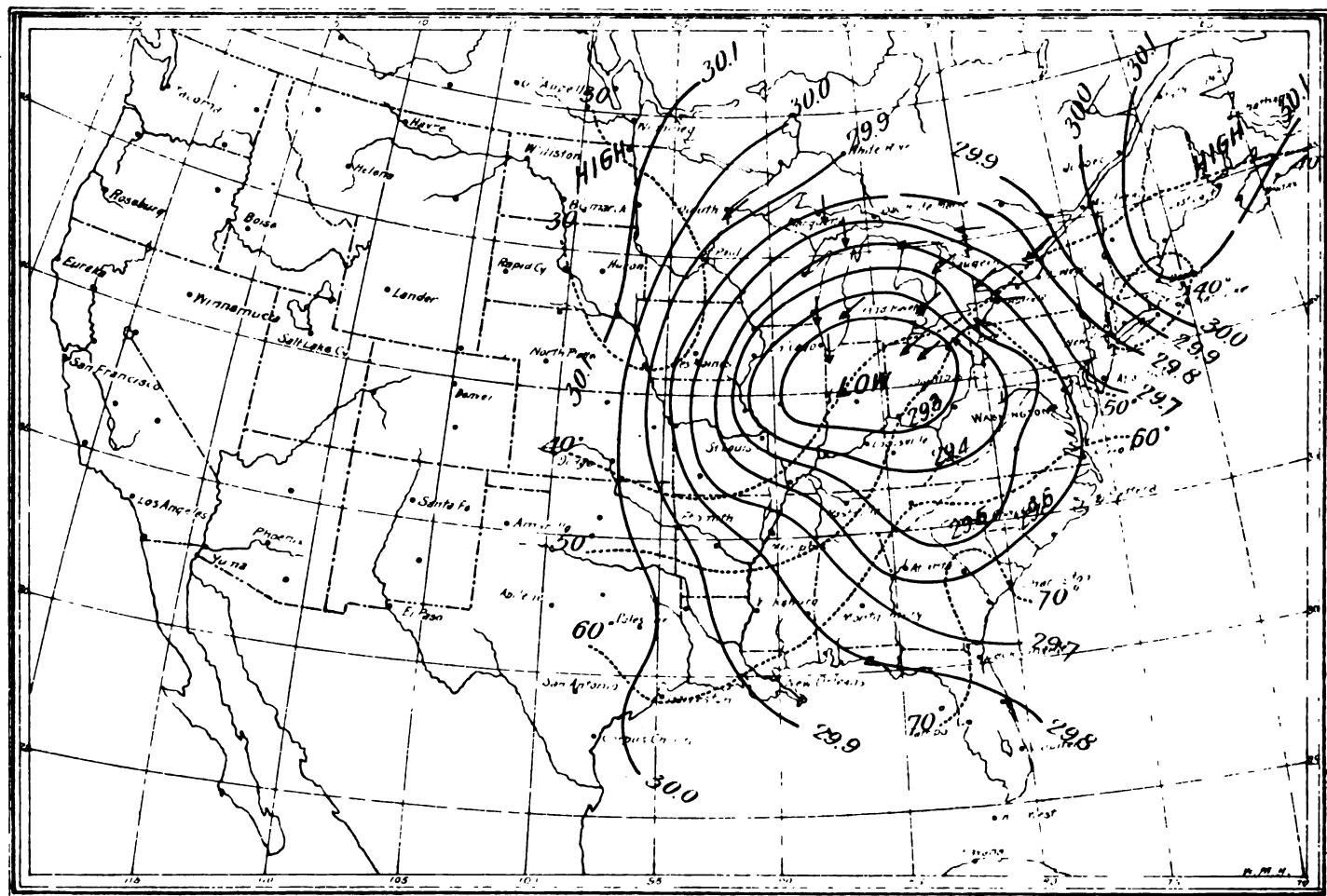
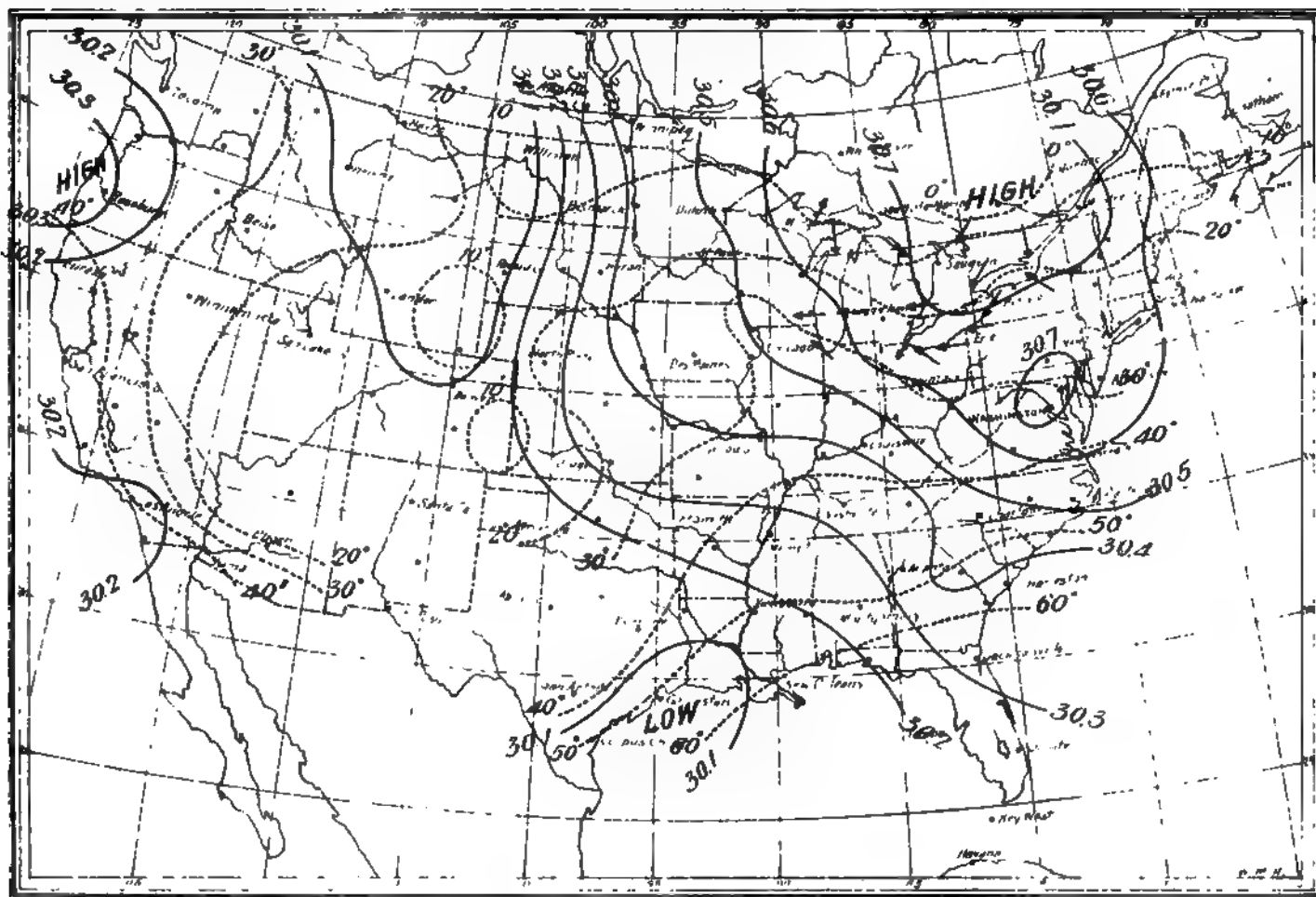


Chart CLXIV.

March 19, 1881—3 p. m.





March 8, 1882—8 p. m.

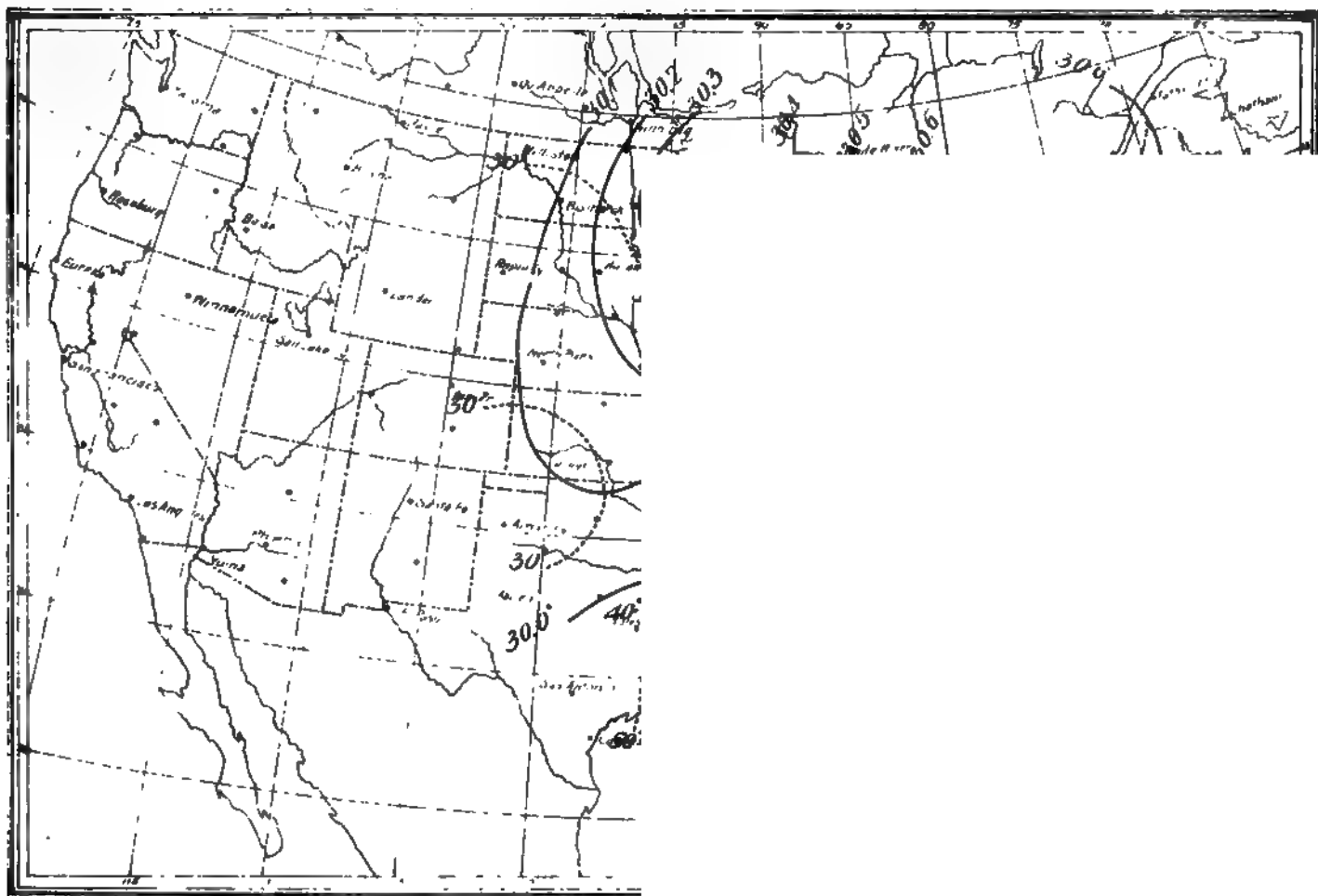


Chart OLXVII

March 9, 1892—7 a. m.

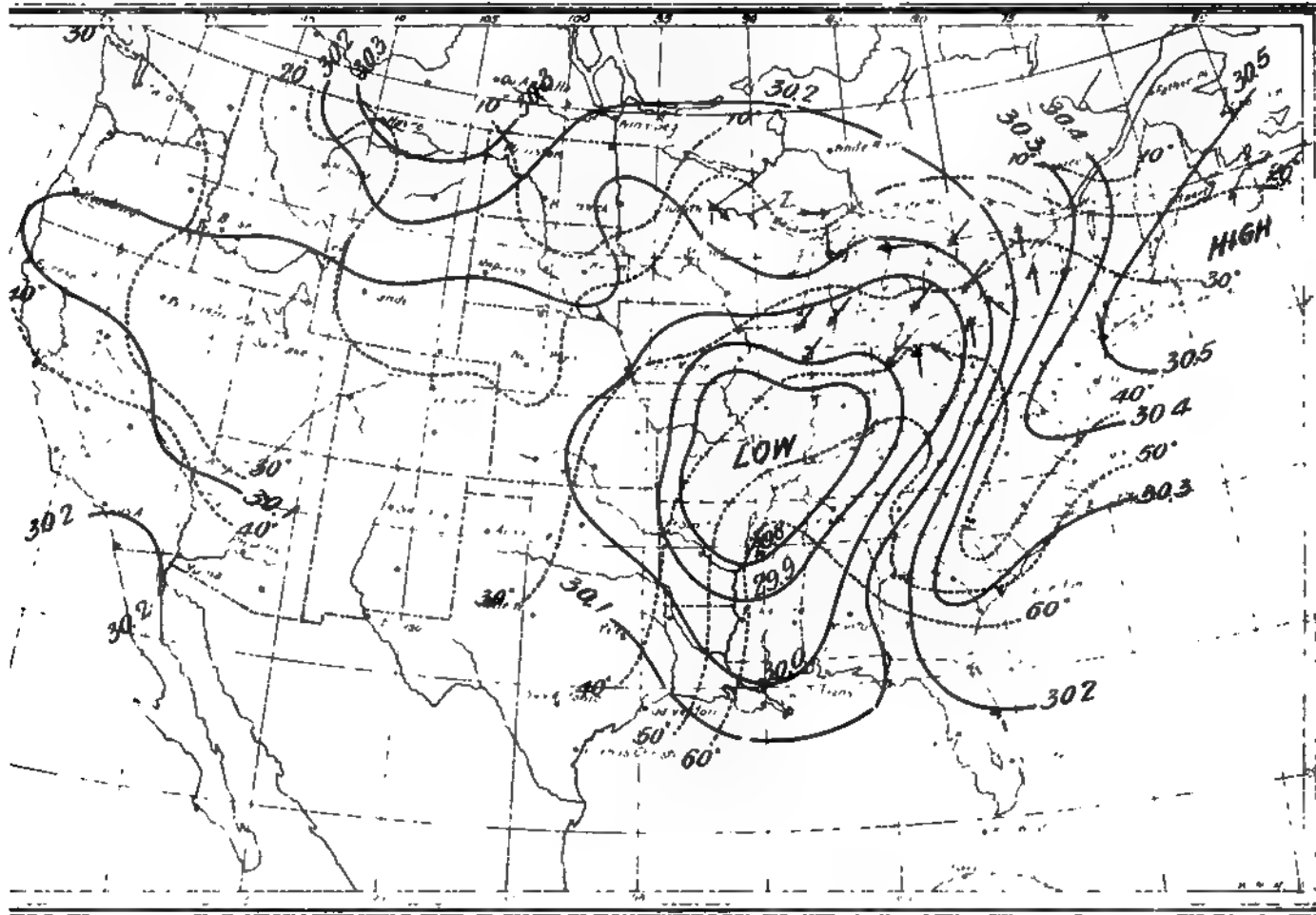


Chart OLXVIII

March 9, 1892—3 p. m.

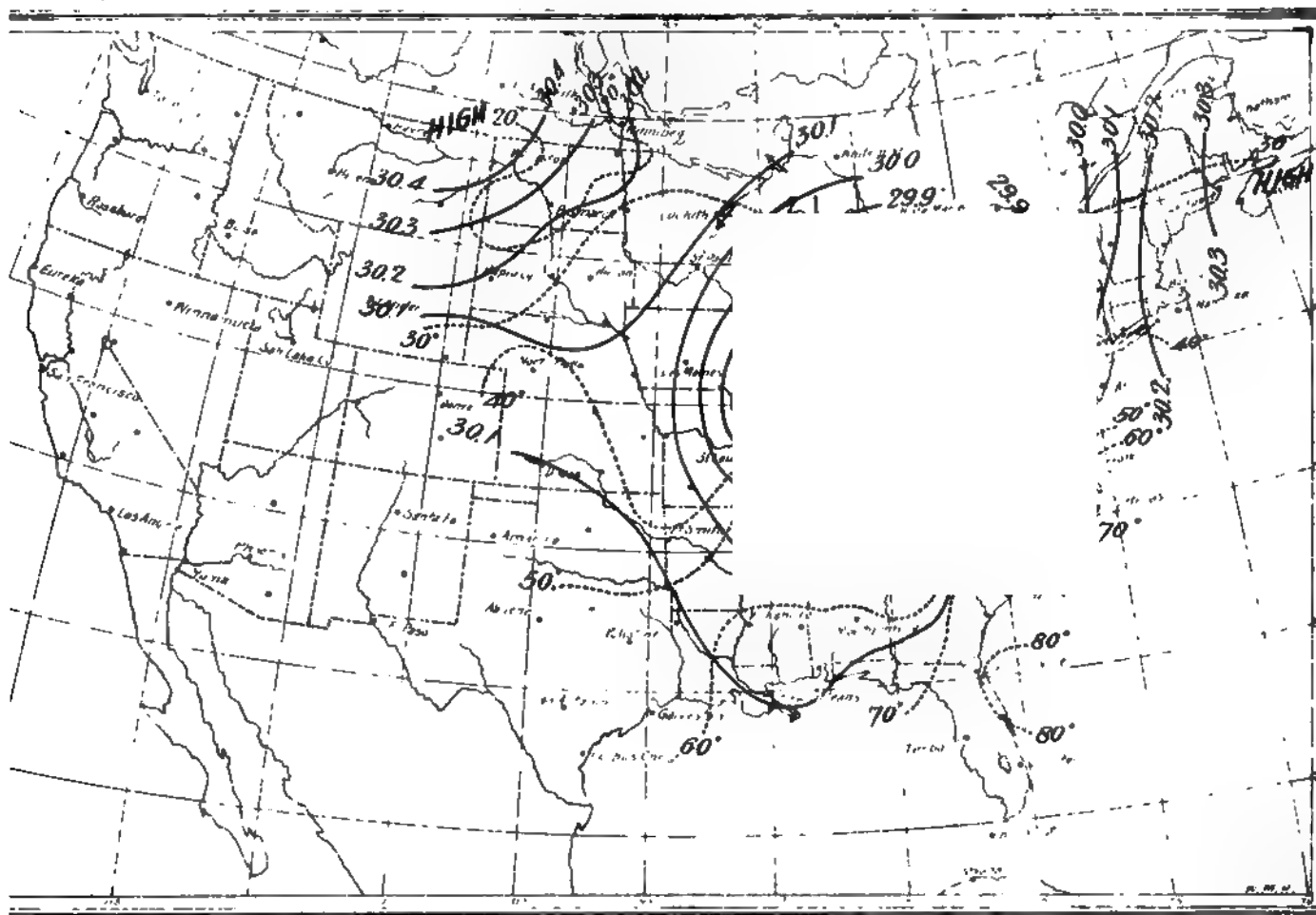


Chart OLXIX.

March 20, 1882—7 a. m.

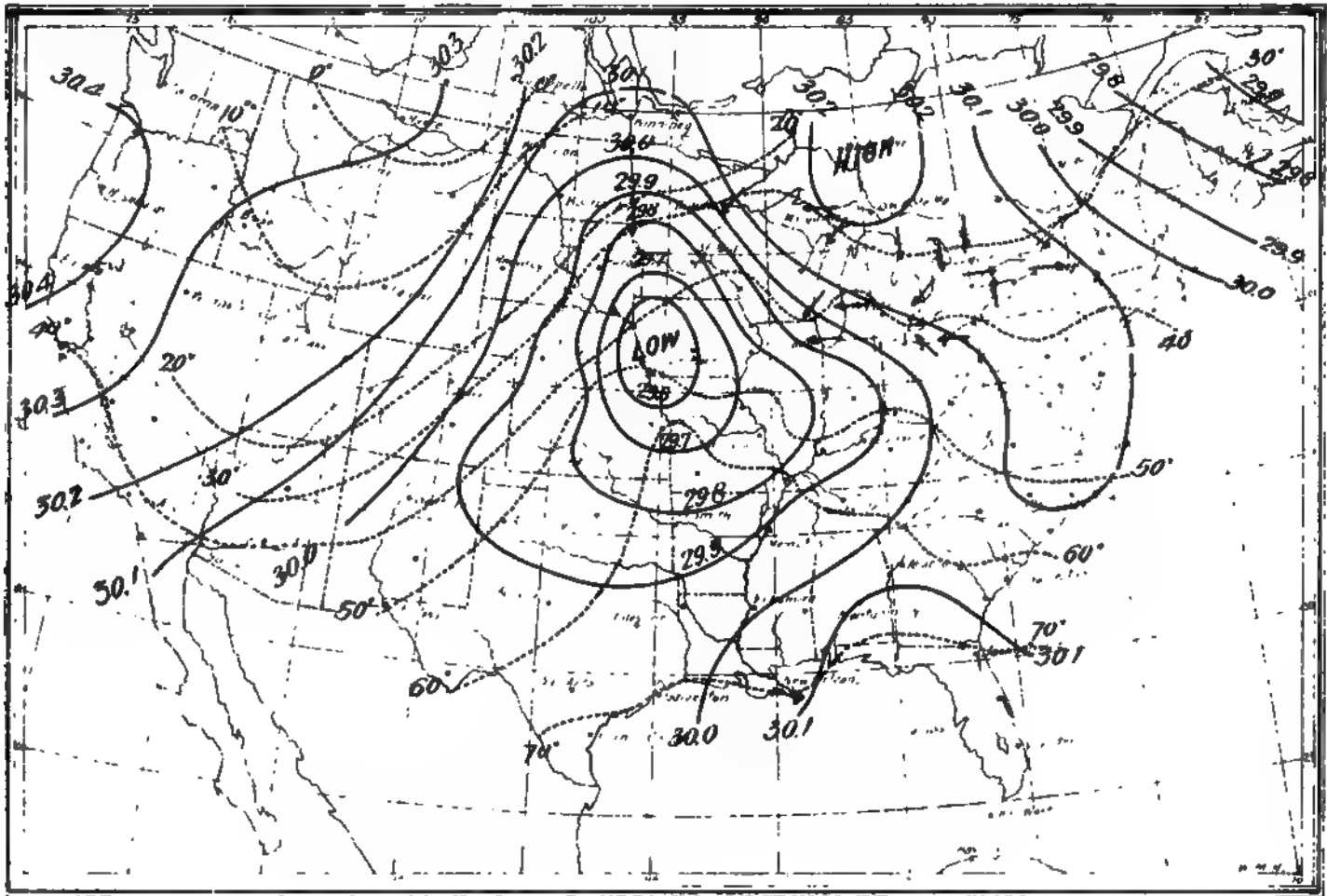


Chart OLXX.

March 20, 1882—3 p. m.

Chart OLXXI.

March 21, 1882—7 a. m.

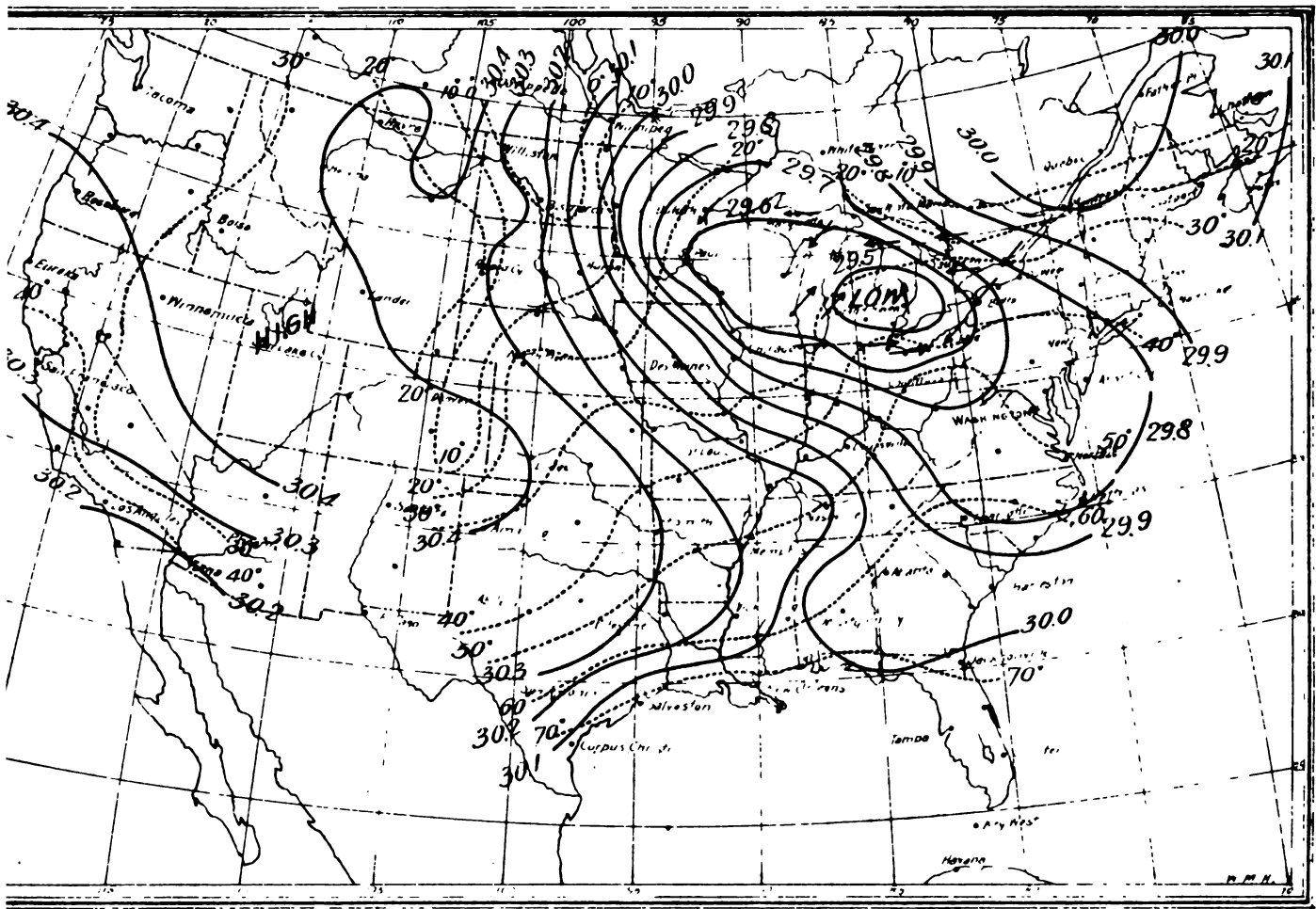


Chart OLXXII.

March 21, 1882—3 p. m.

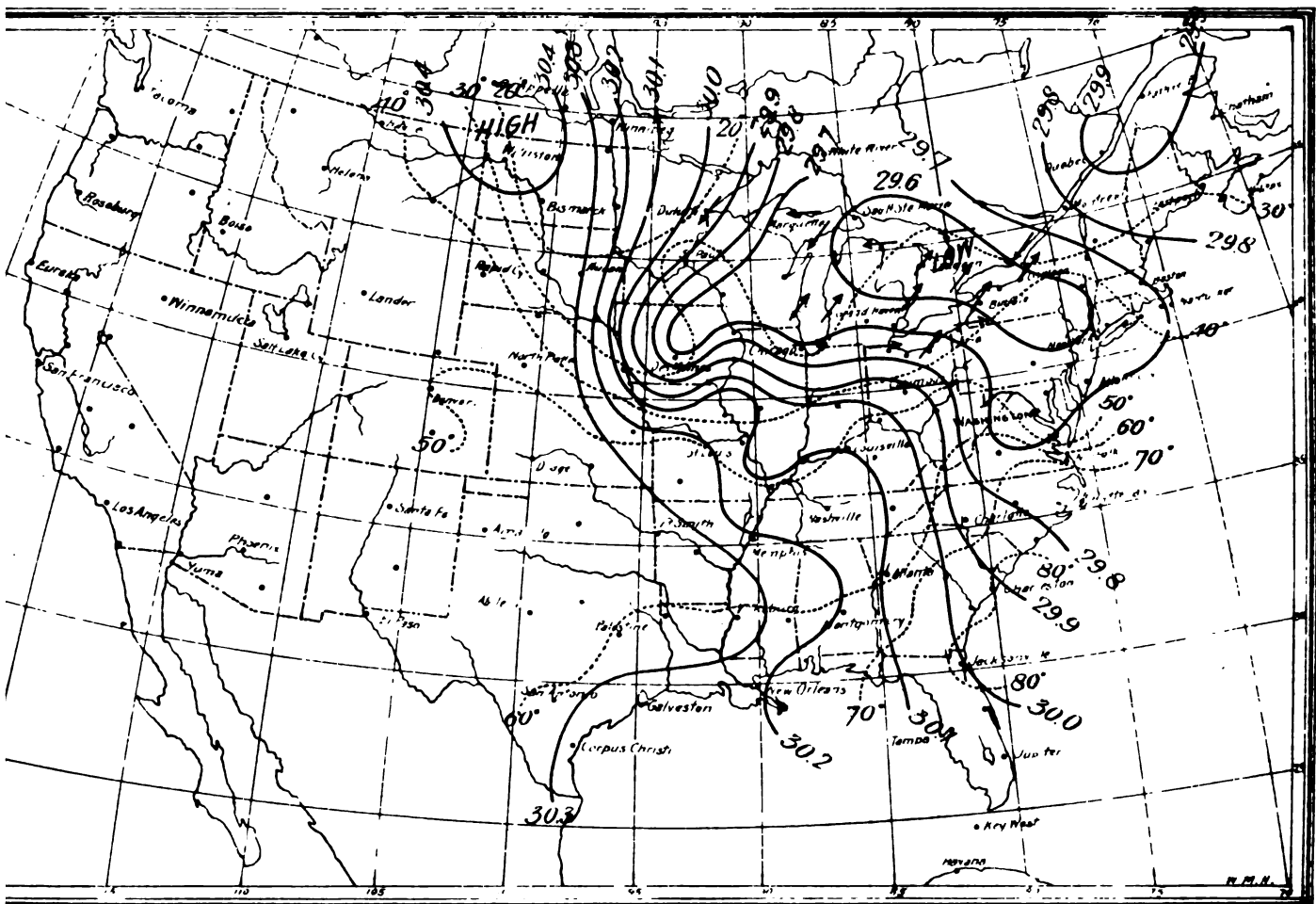


Chart OLXXXIII.

March 10, 1884—7 a. m.

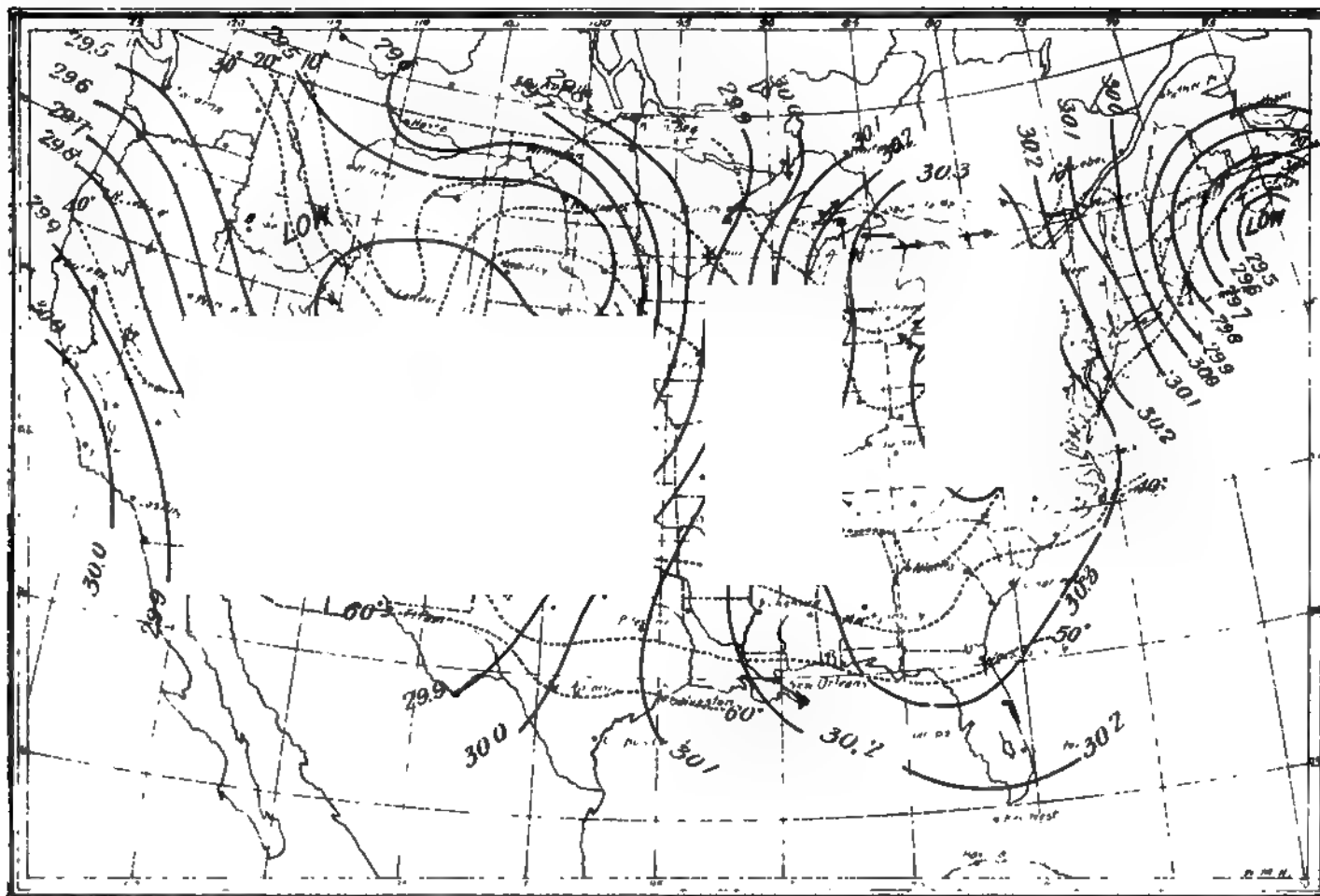


Chart OLXXXIV.

March 10, 1884—3 p. m.

Chart OLXXV.

March 11, 1894—7 a. m.

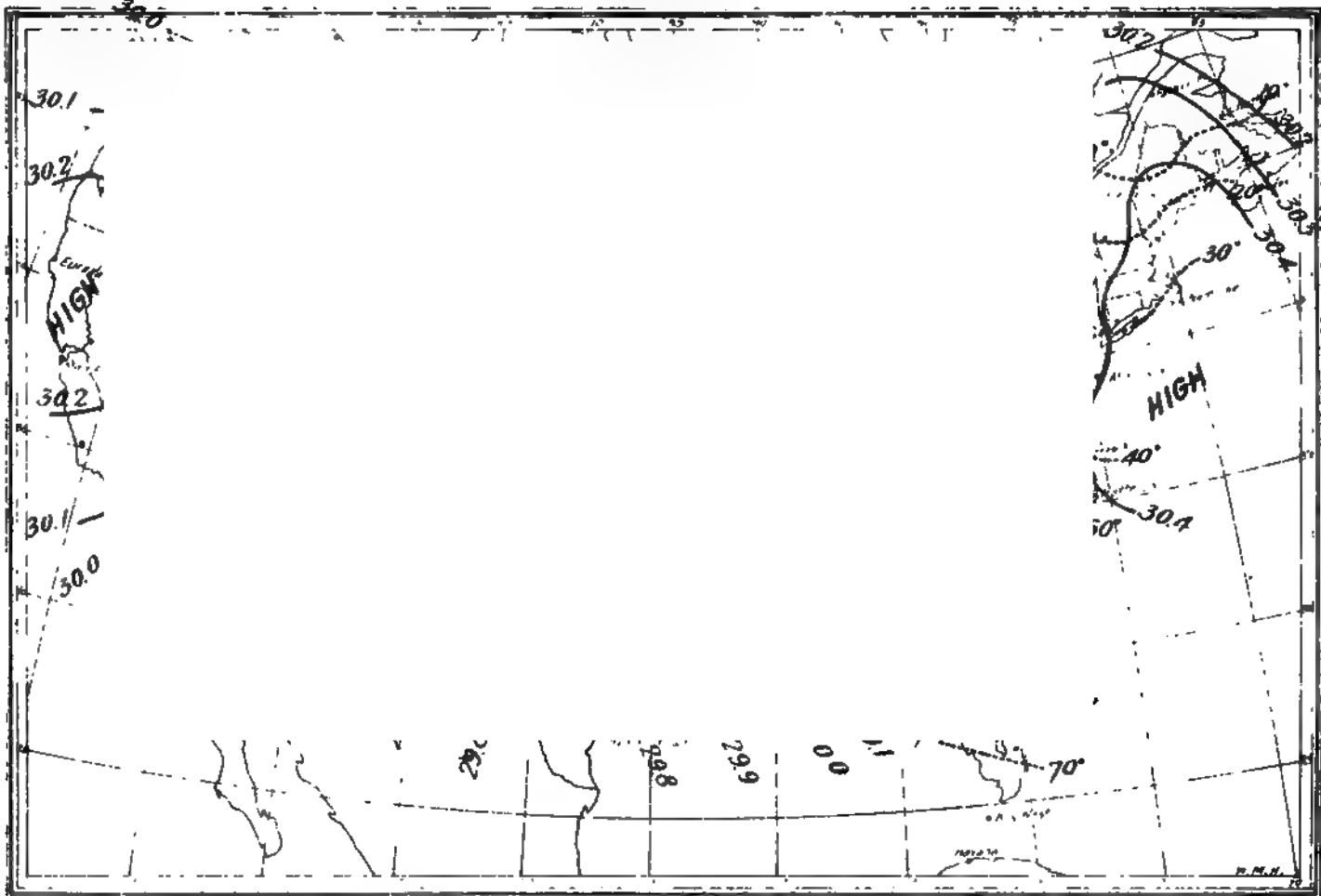


Chart OLXXVI.

March 11, 1894—3 p. m.

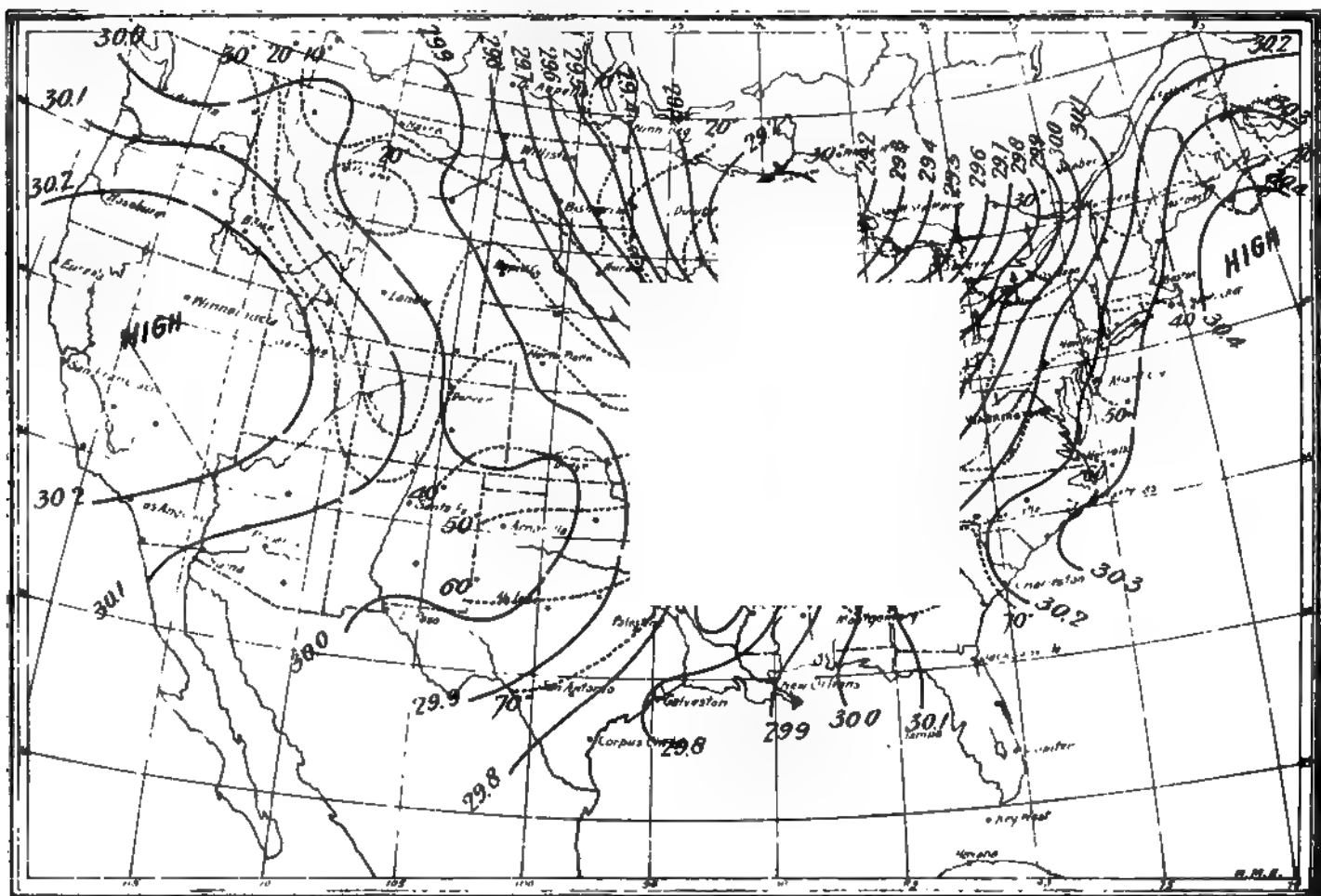


Chart CLXXVII.

March 13, 1885—7 a. m.

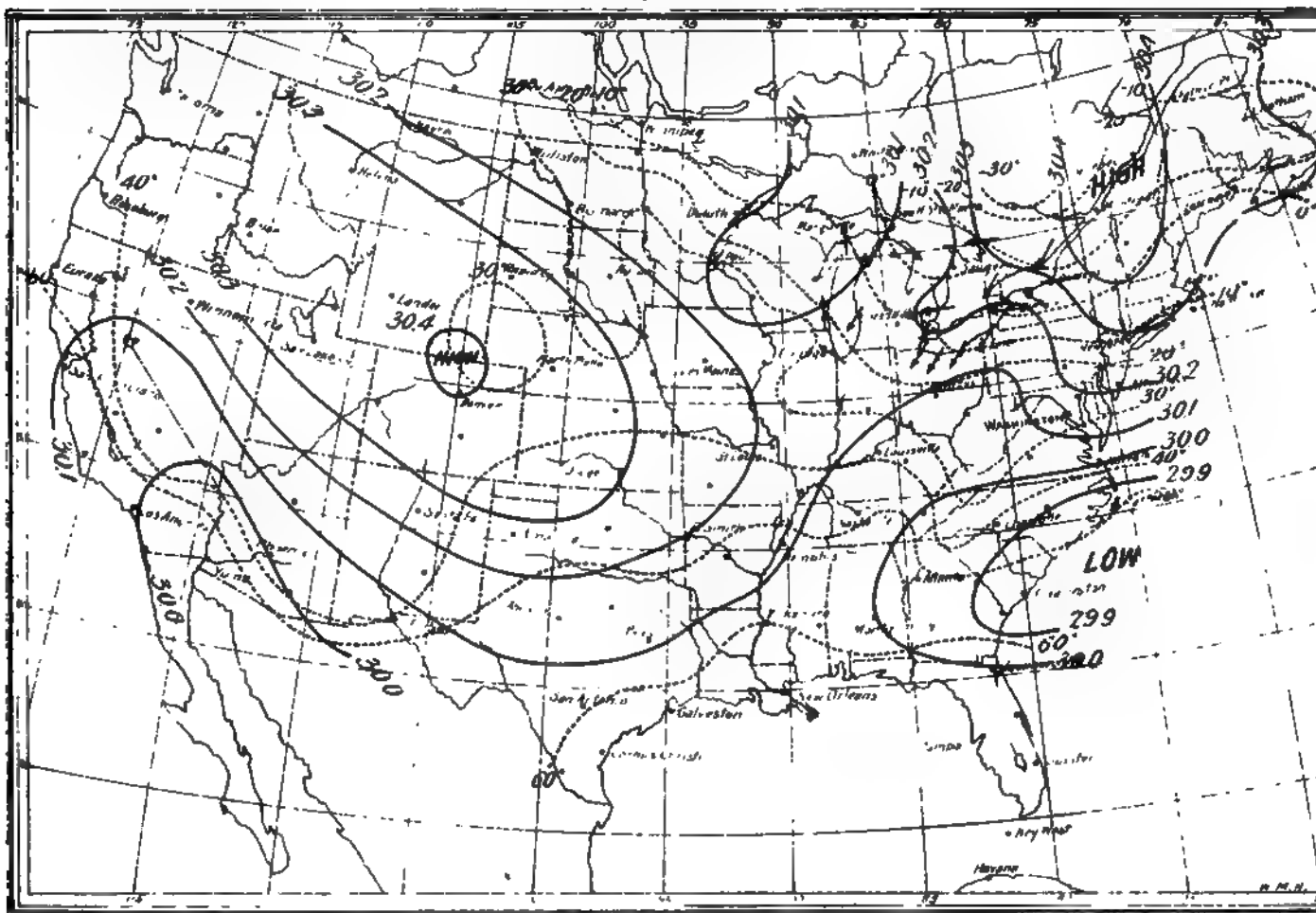
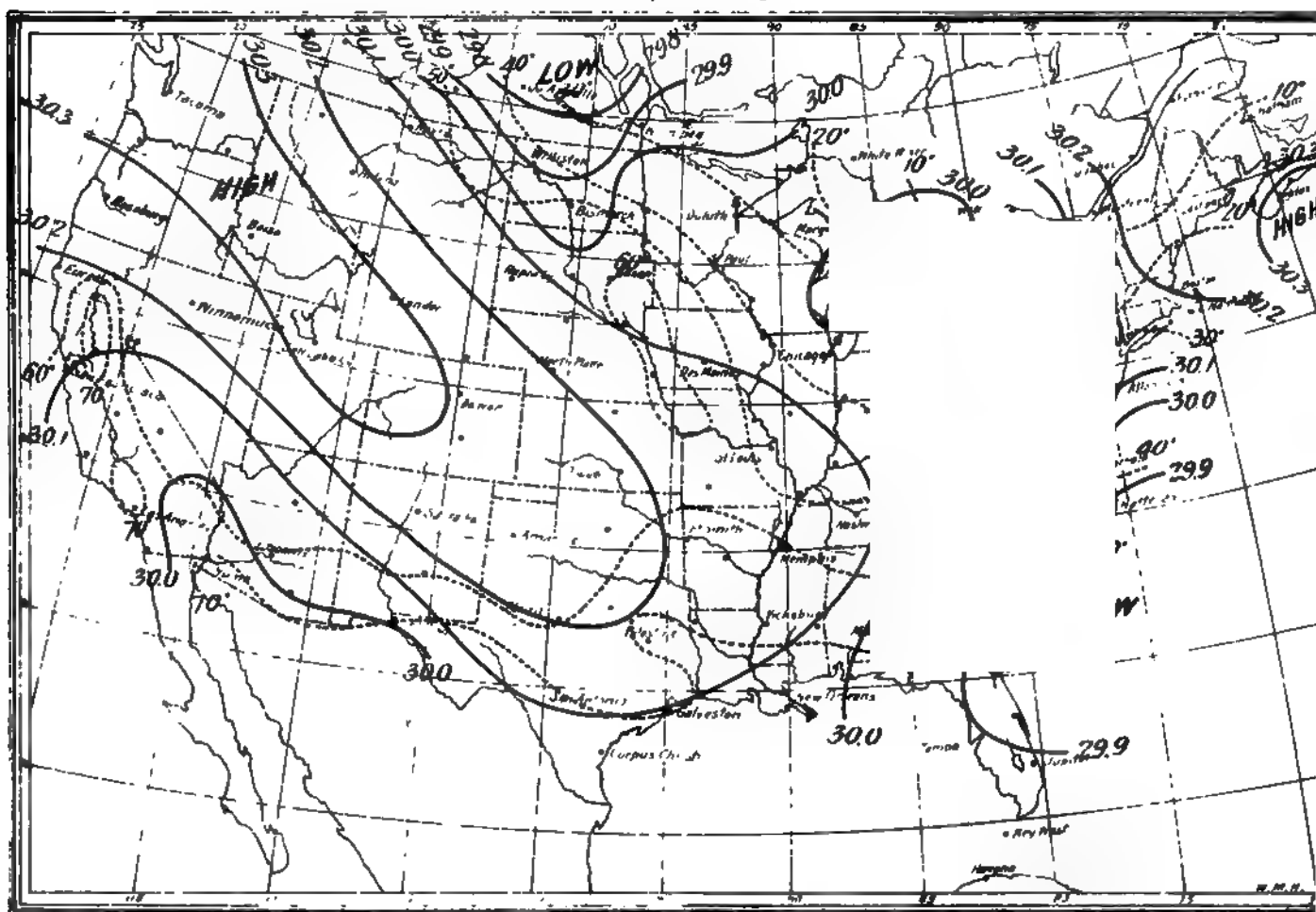
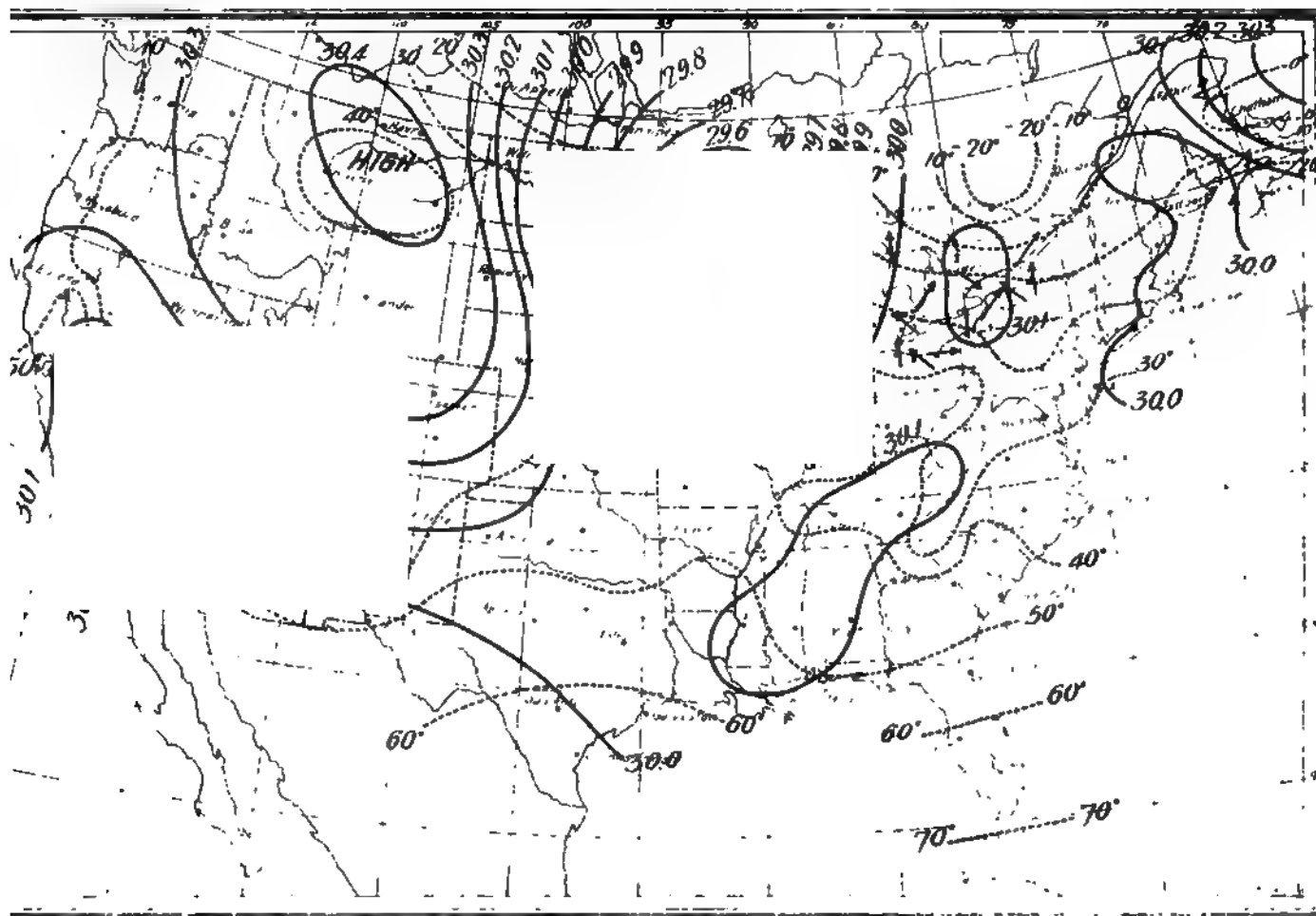


Chart CLXXVIII.

March 13, 1885—3 p. m.



March 14, 1885—7 a. m.



March 14, 1885—3 p. m.

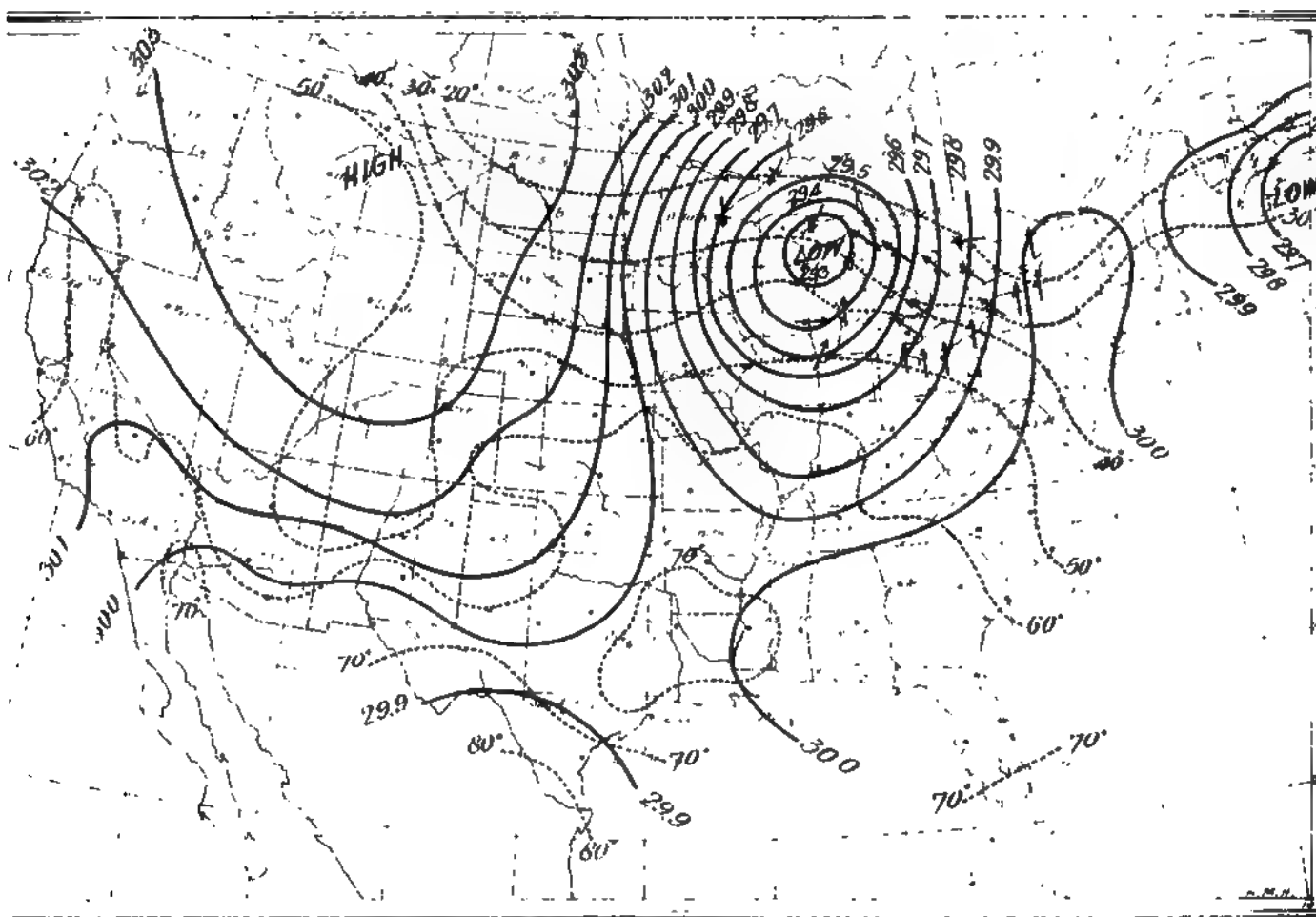


Chart OLXXXI.

March 26, 1890—8 p. m.



Chart OLXXXII.

March 27, 1890—9 a. m.



Chart OLXXXIII.

March 27, 1890—8 p. m.

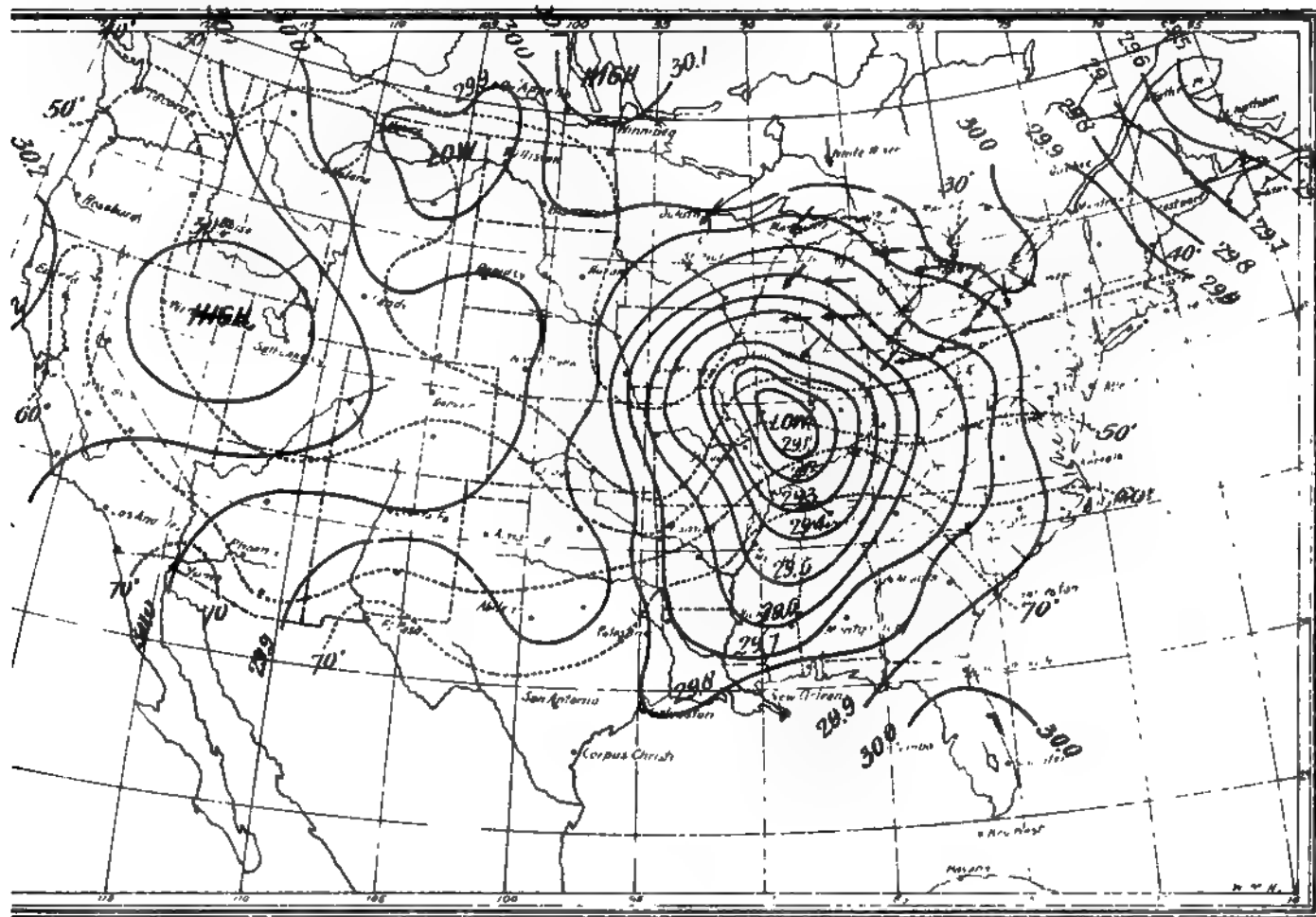


Chart OLXXXIV.

March 28, 1890—8 a. m.

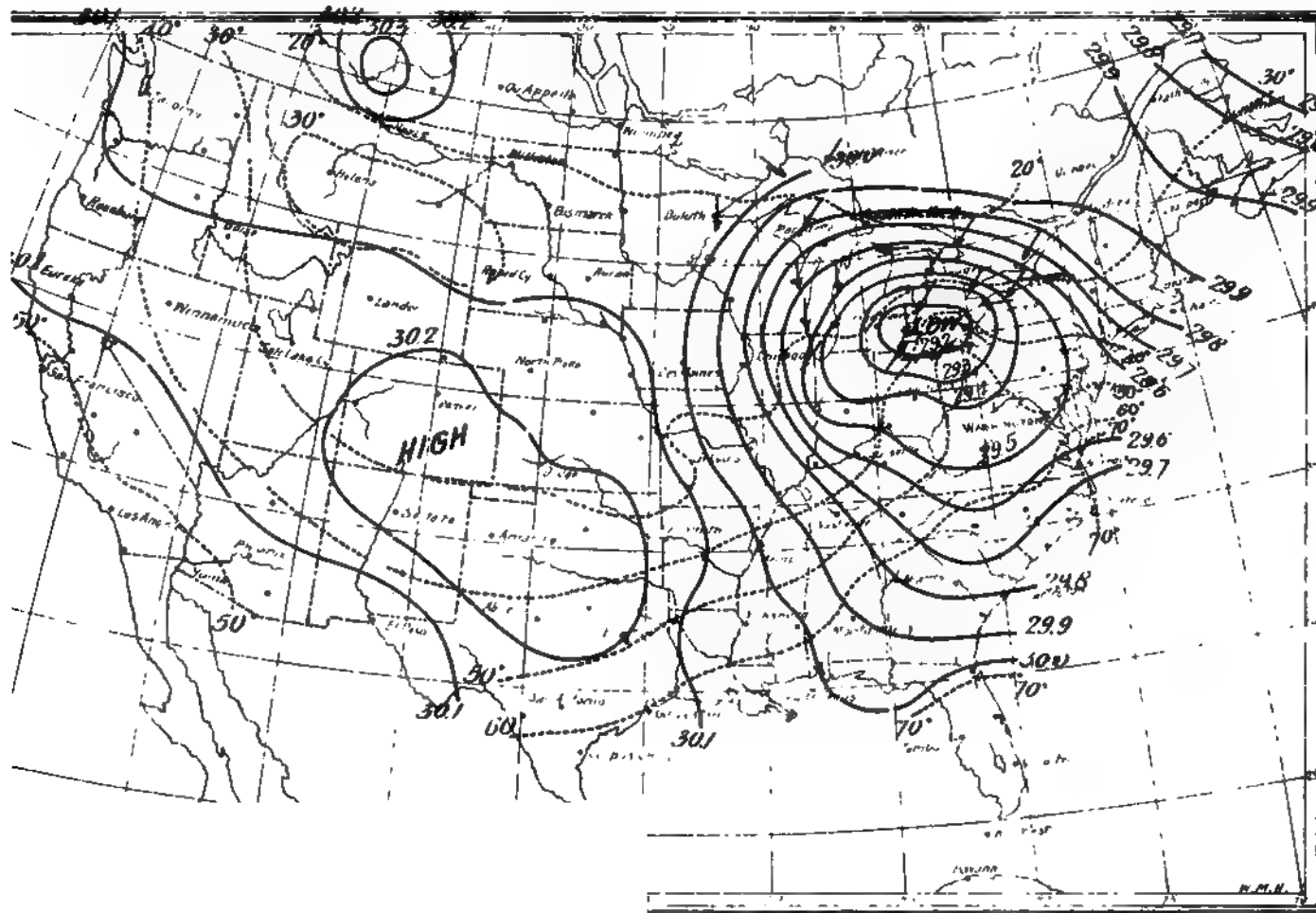


Chart OLXXXV.

March 2, 1891—8 p. m.

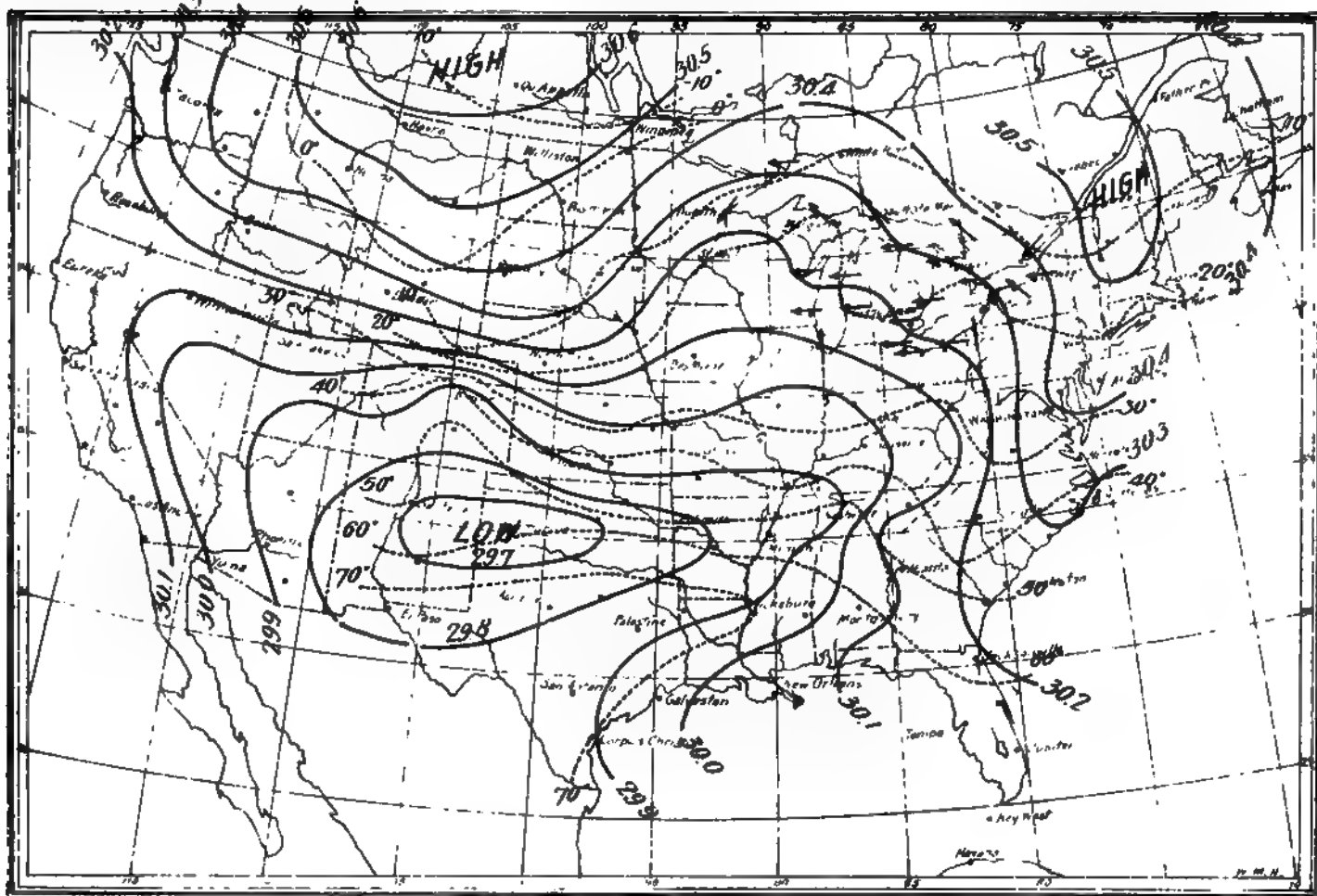


Chart OLXXXVI.

March 3, 1891—8 a. m.

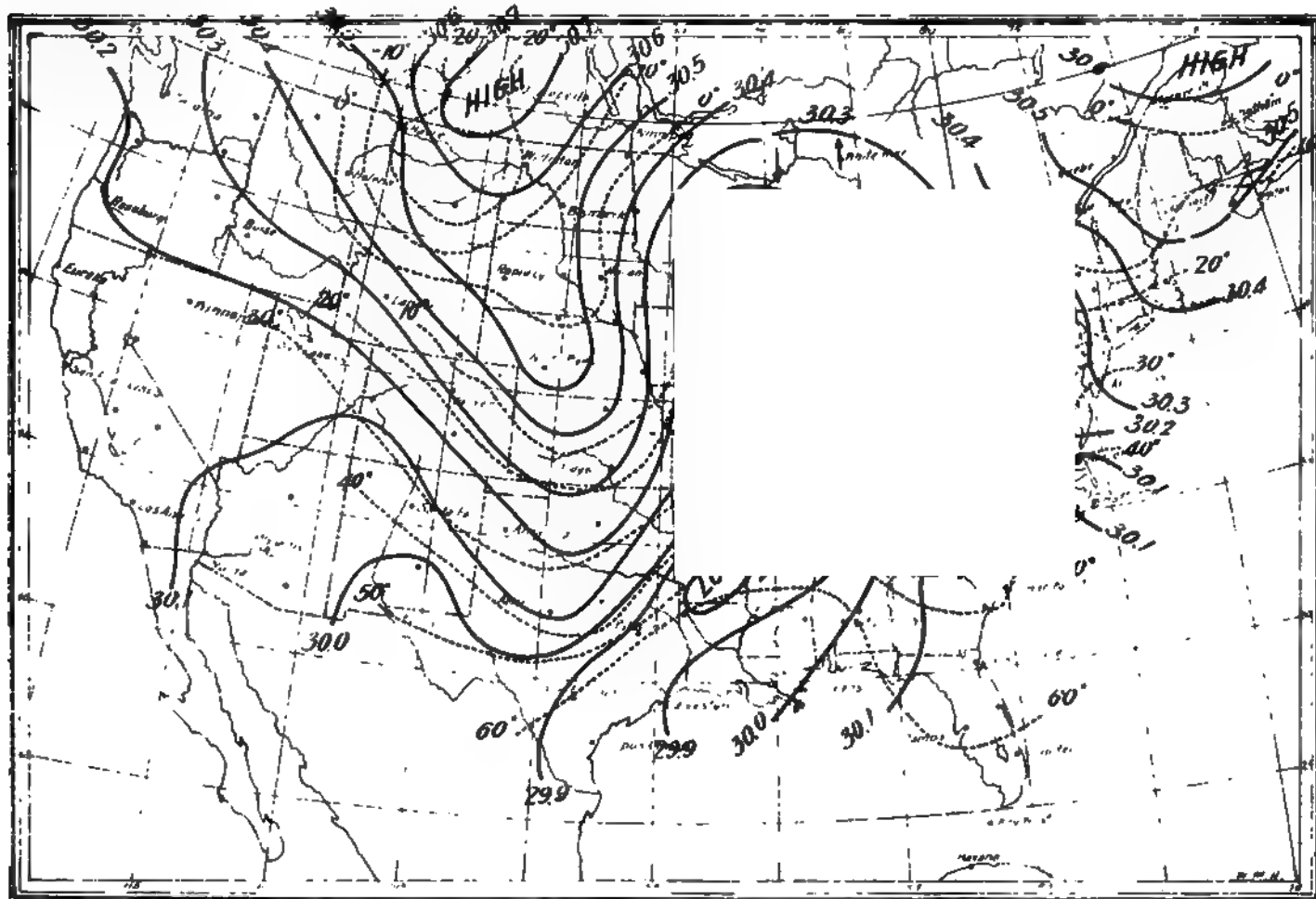


Chart OLXXXVII.

March 3, 1891—8 p. m.

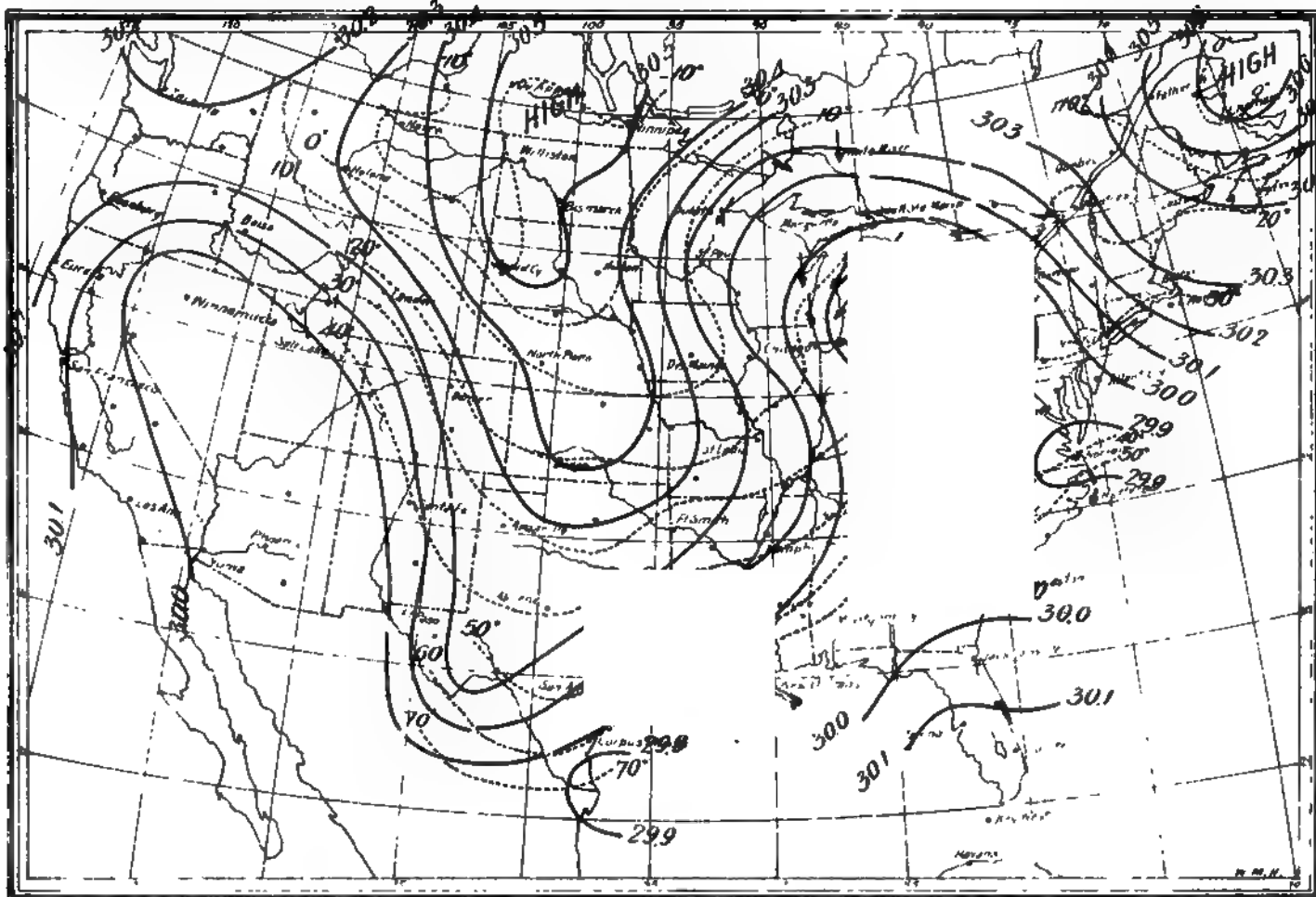
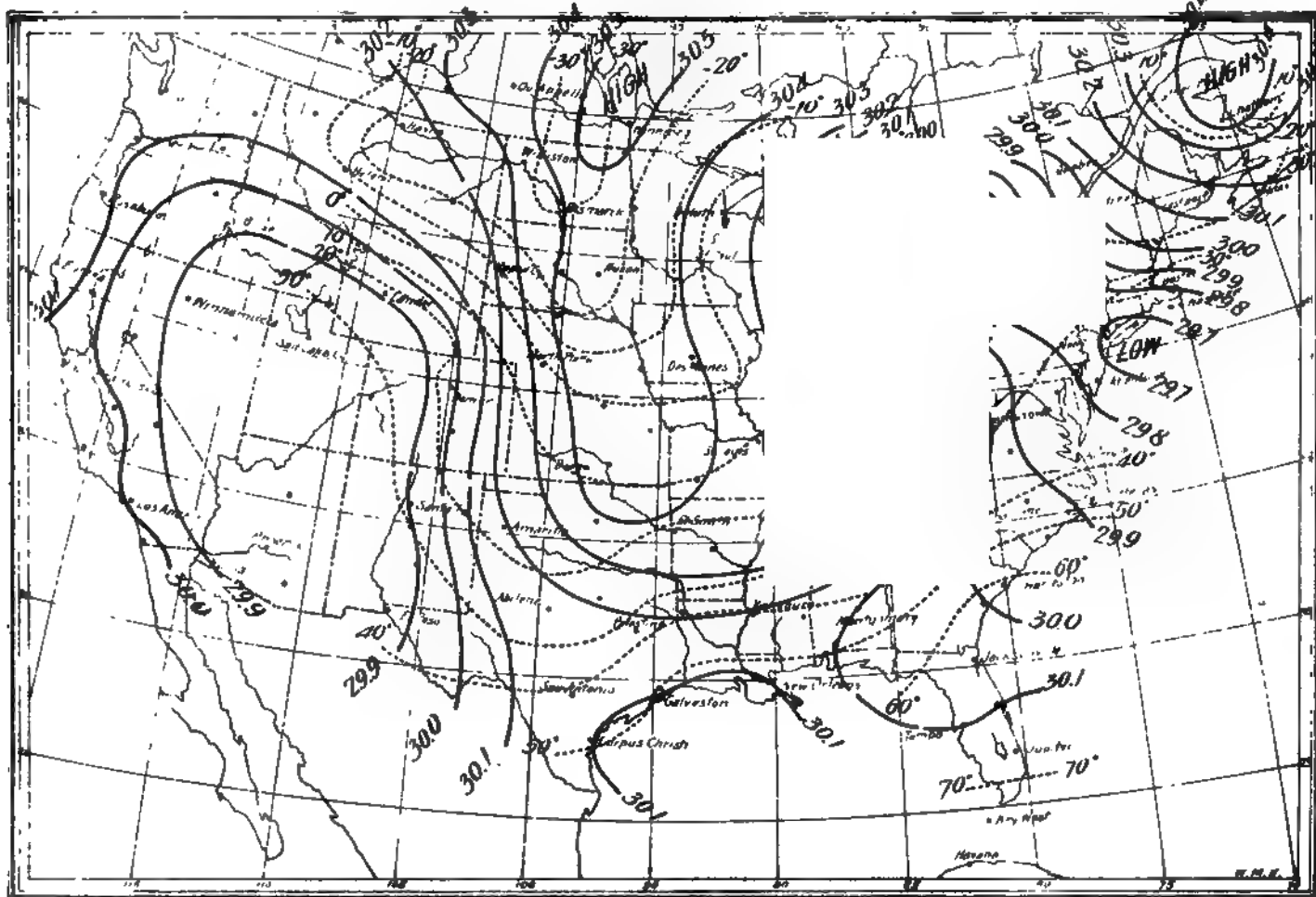


Chart OLXXXVIII.

March 4, 1891—8 a. m.



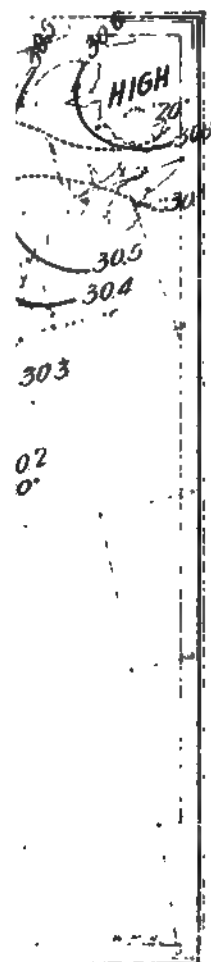
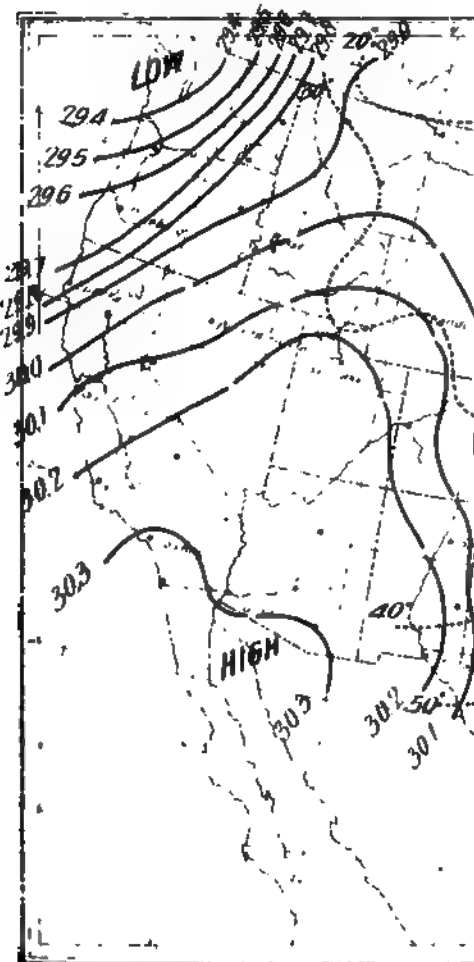
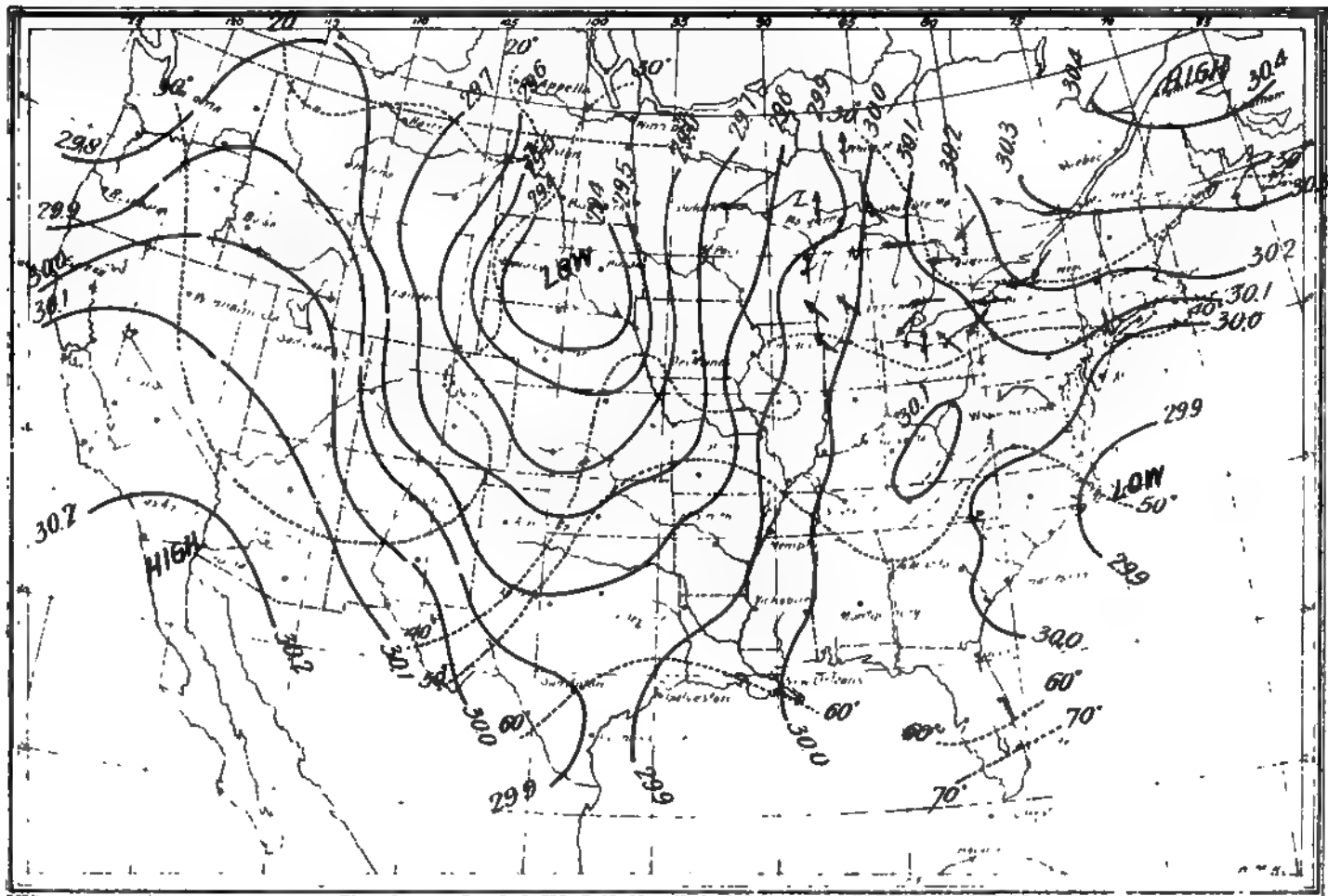


Chart OXOI

March 11, 1898—8 a. m.

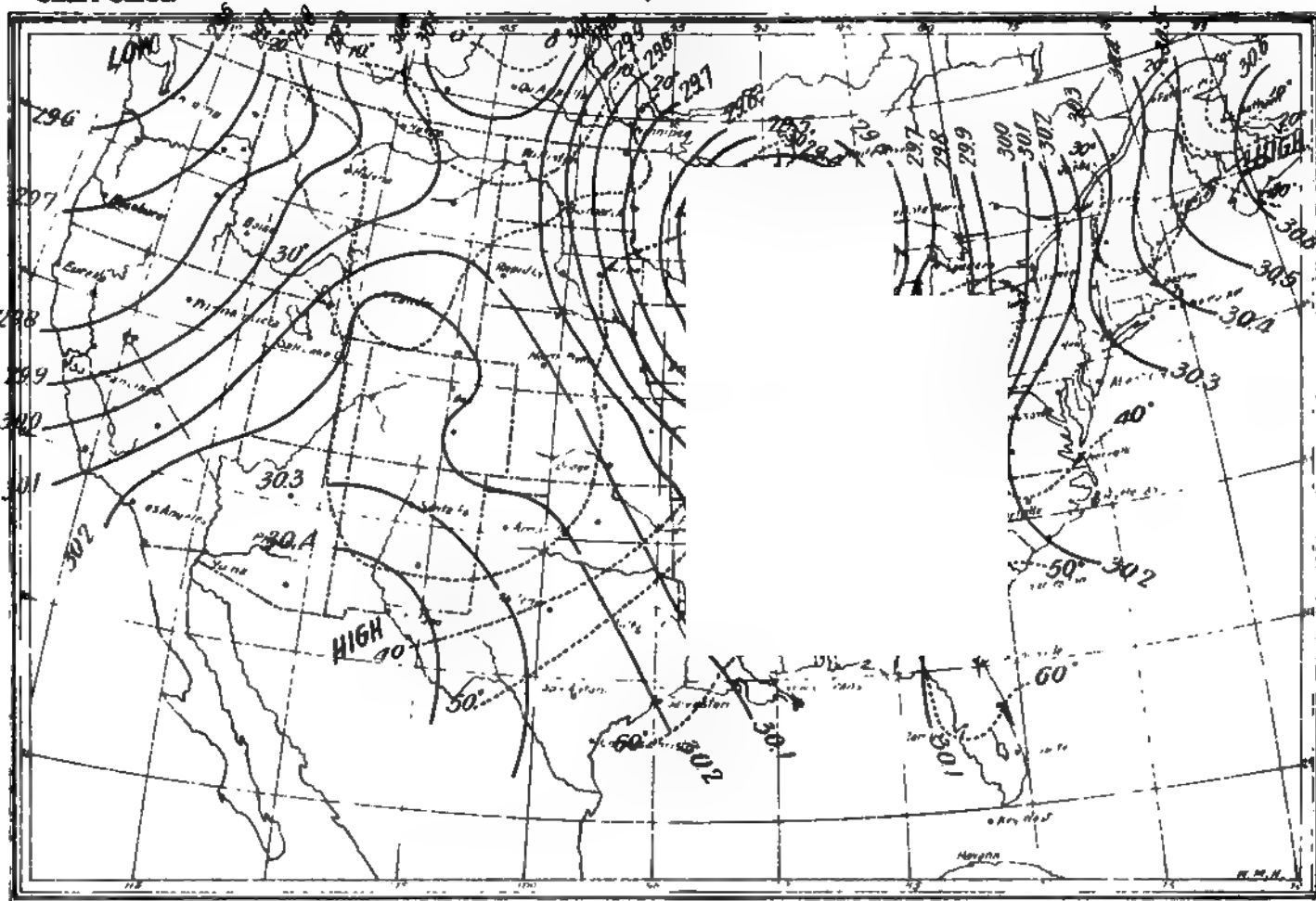


Chart OXOII

March 11, 1898—8 p. m.

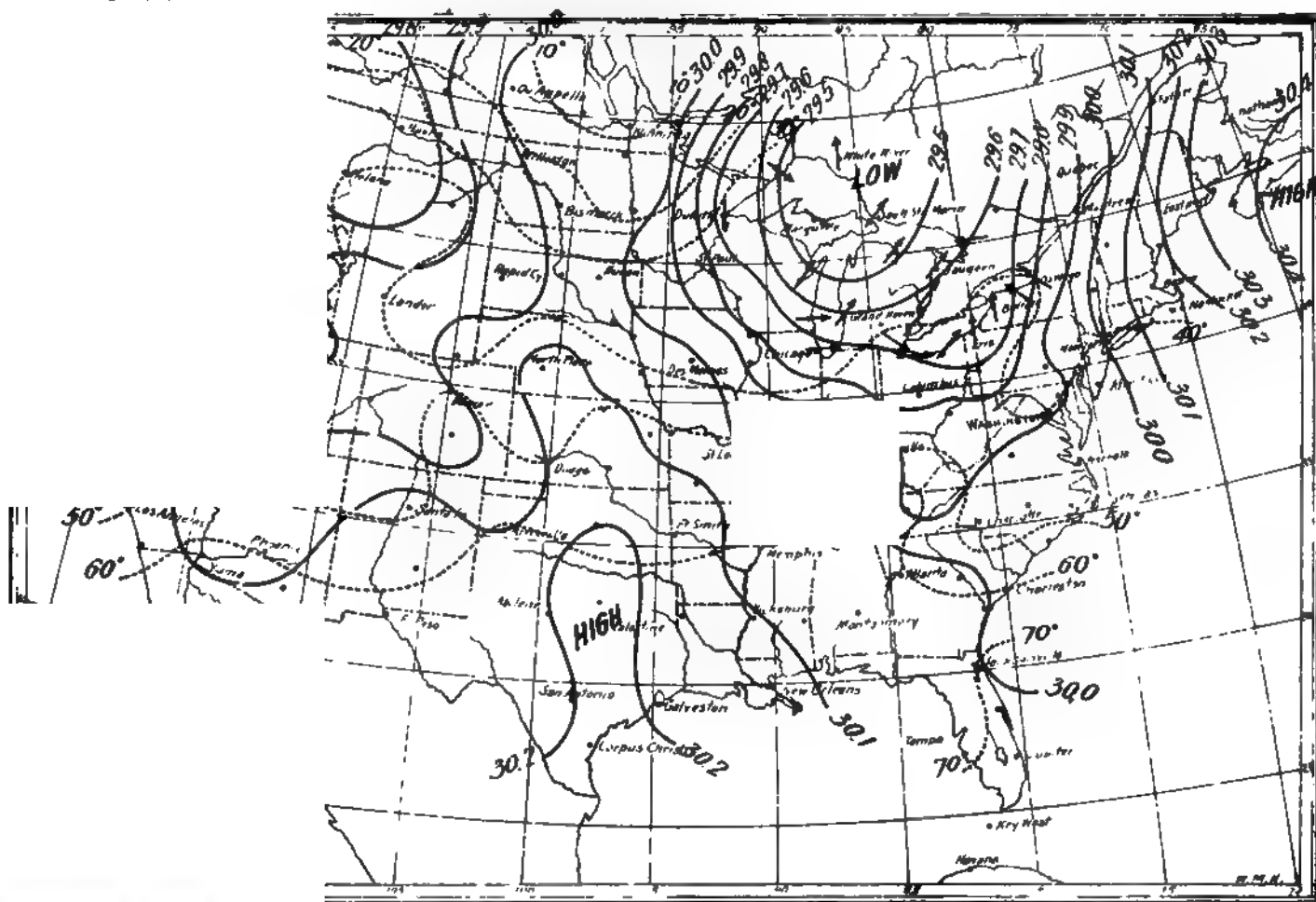


Chart OXOIII.

March 10, 1894—8 a. m.

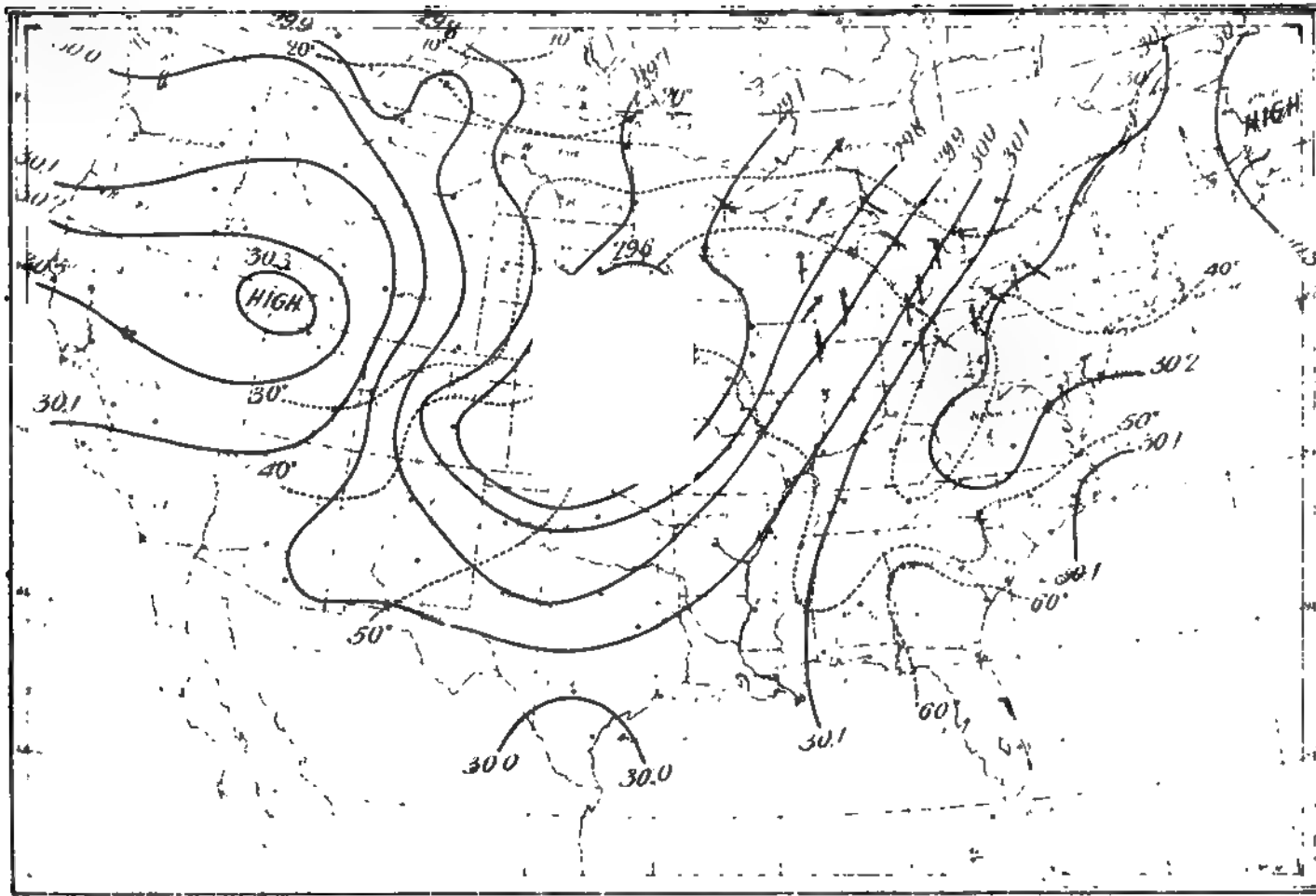


Chart OXOIV.

March 10, 1894—8 p. m.

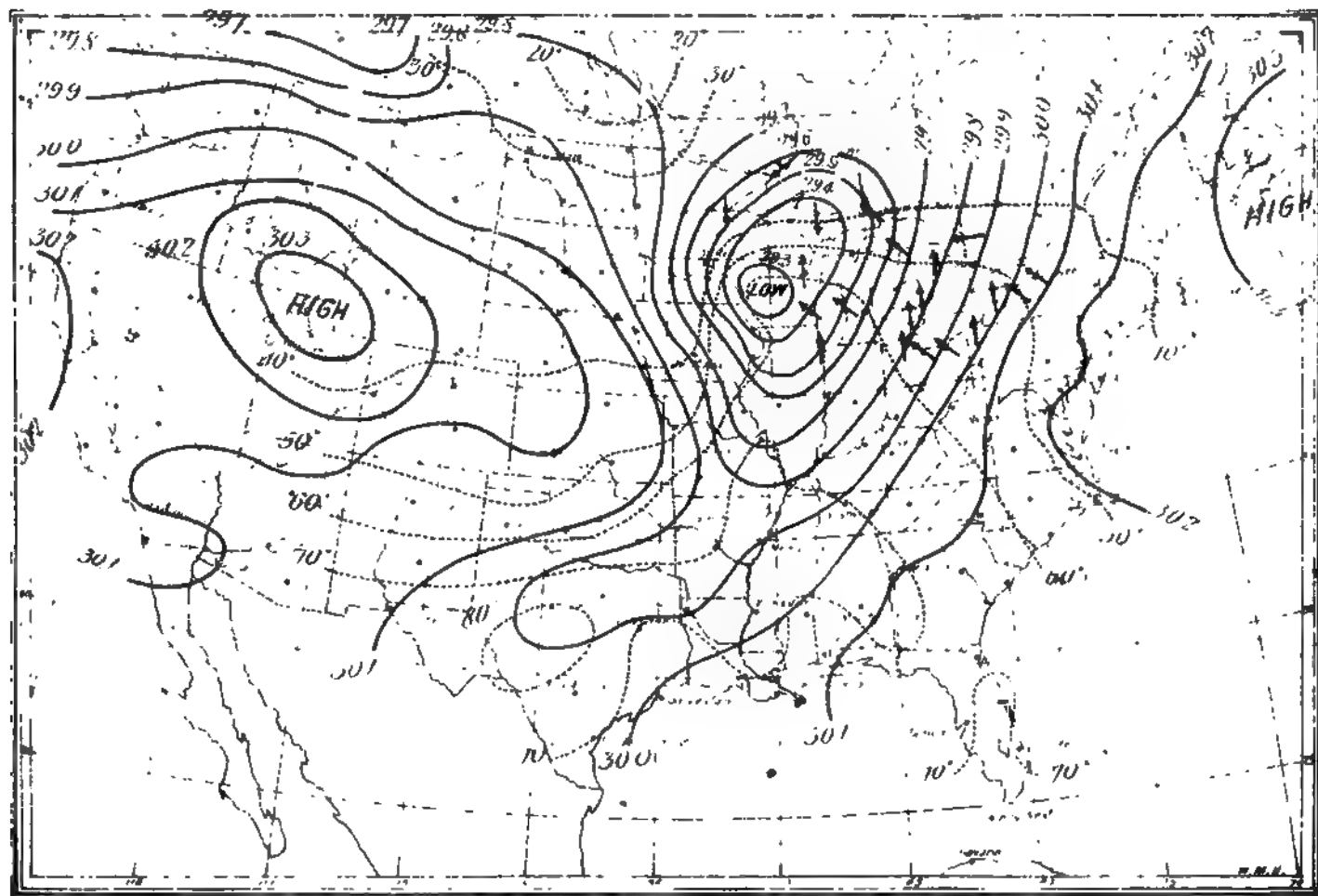


Chart OXOV.

March 11, 1894—8 a. m.

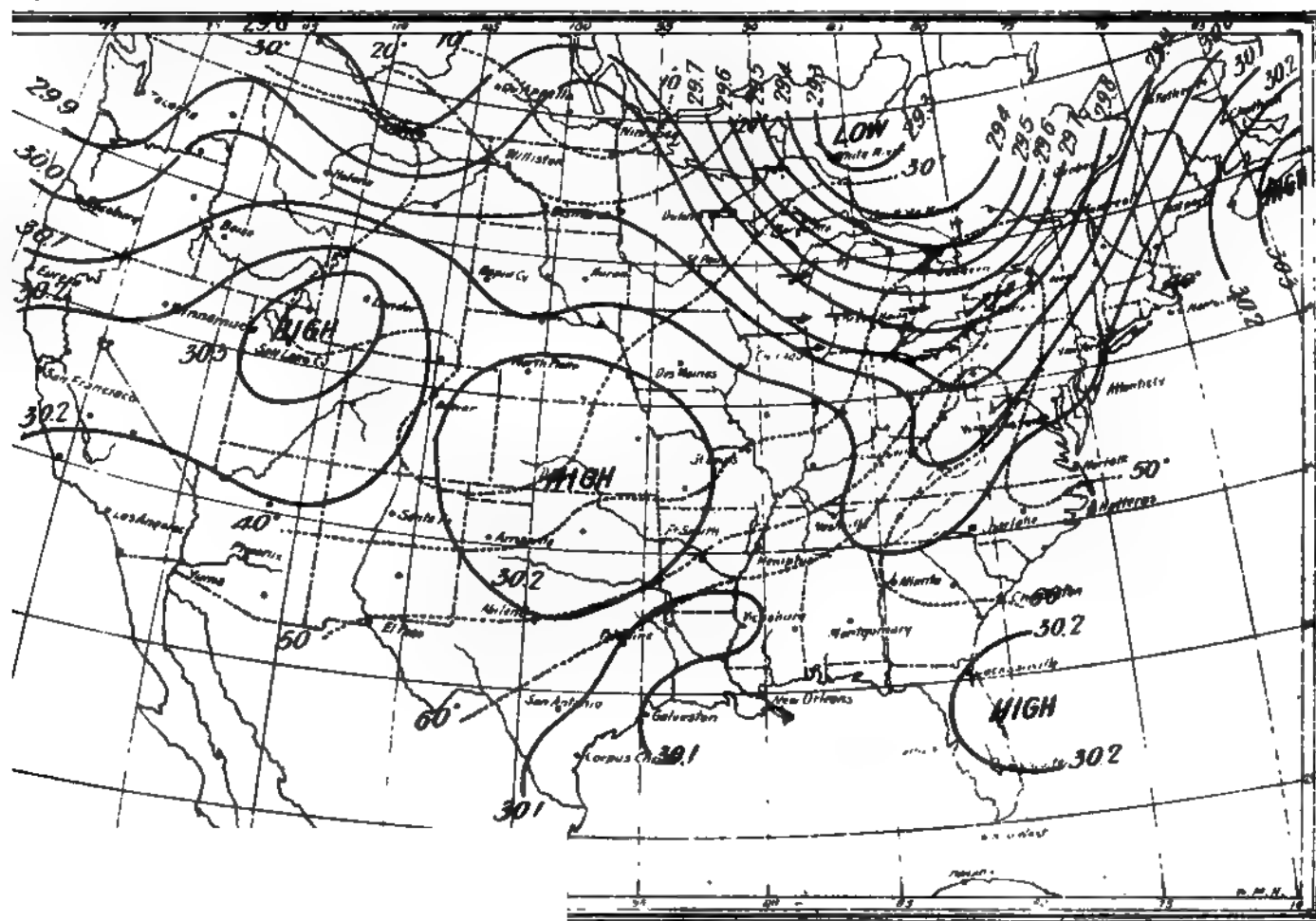


Chart OXOVI.

March 11, 1894—8 p. m.

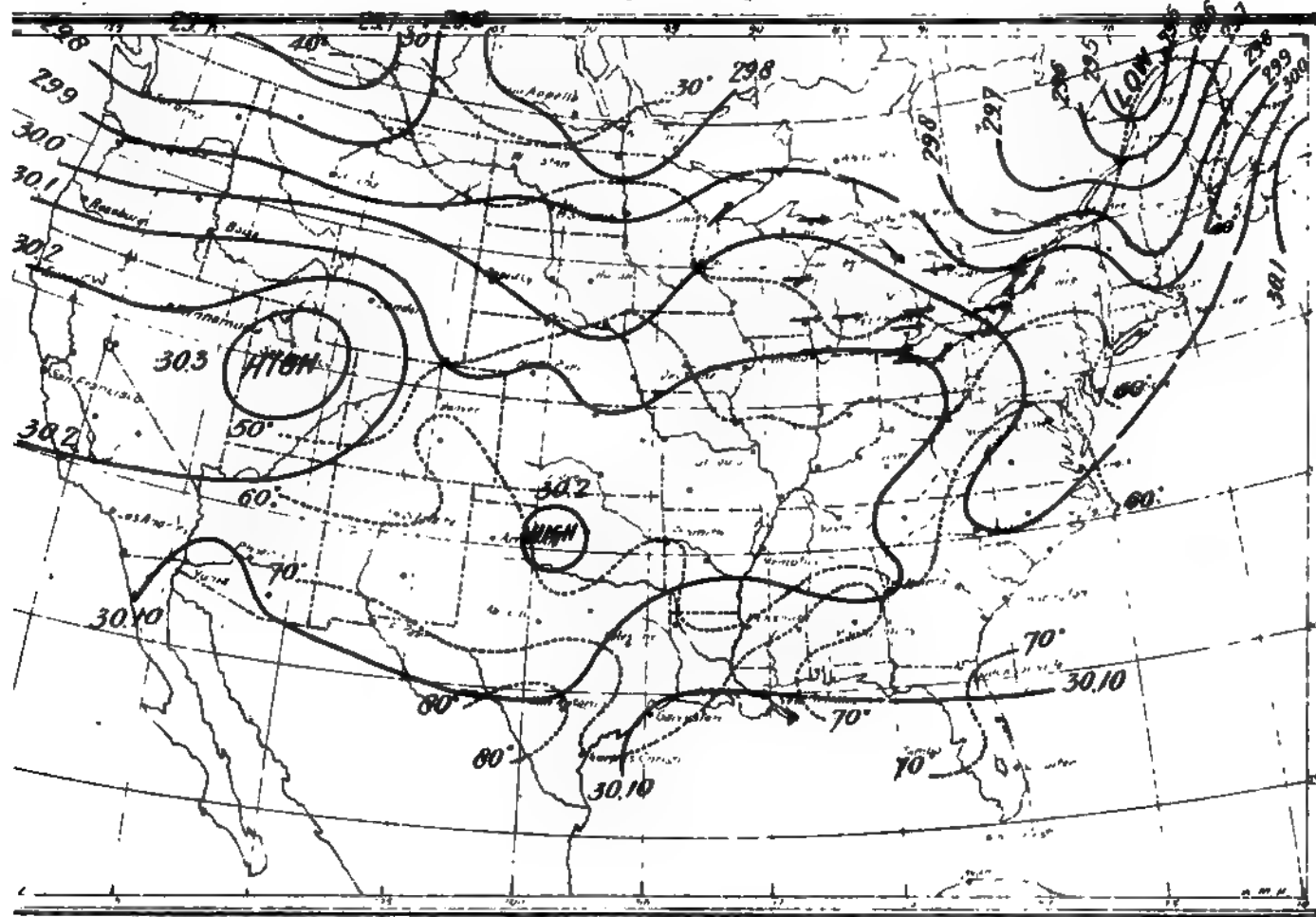


Chart OXOVII.

March 8, 1895—8 a. m.

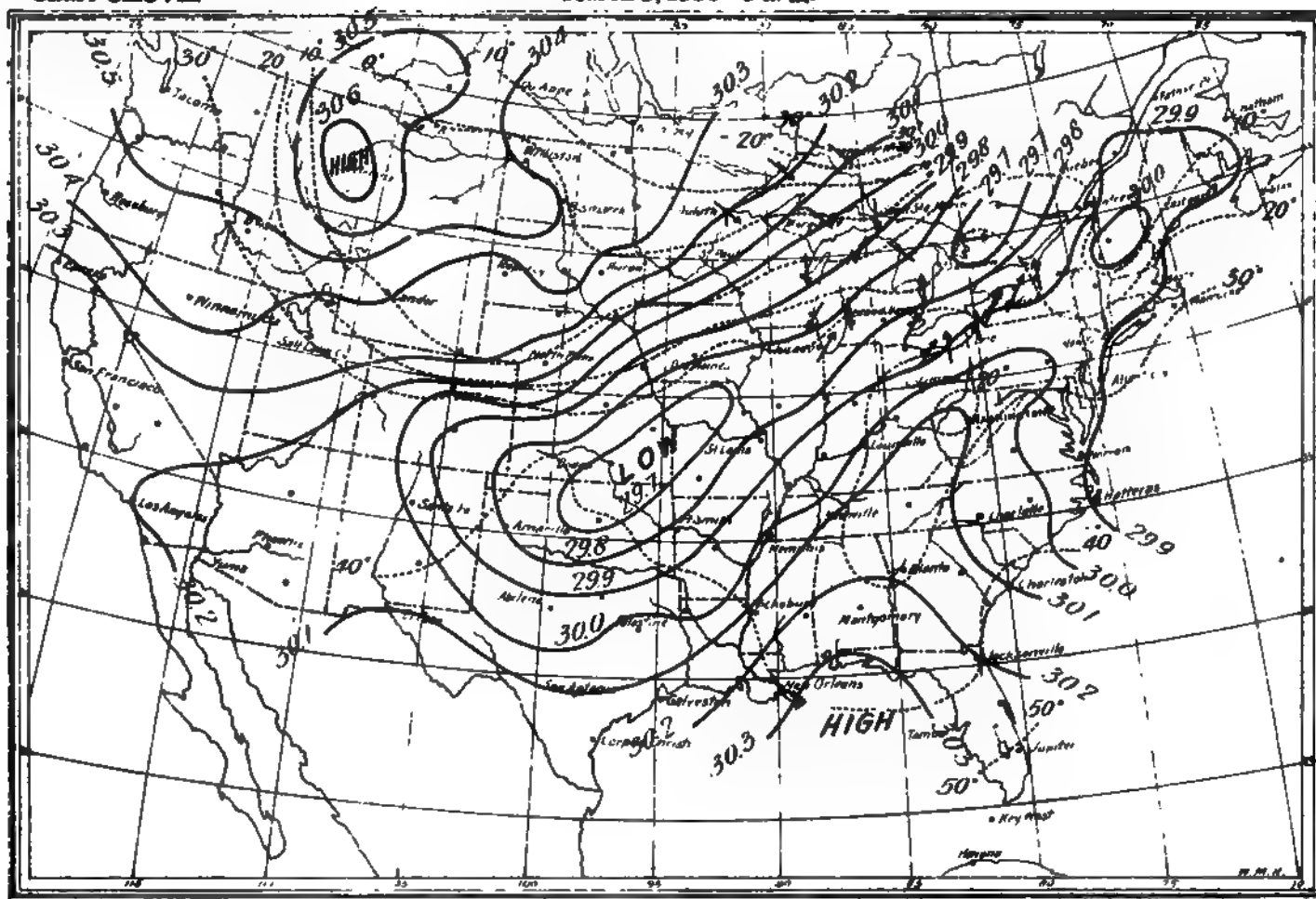


Chart OXOVIII.

March 8, 1895—8 p. m.

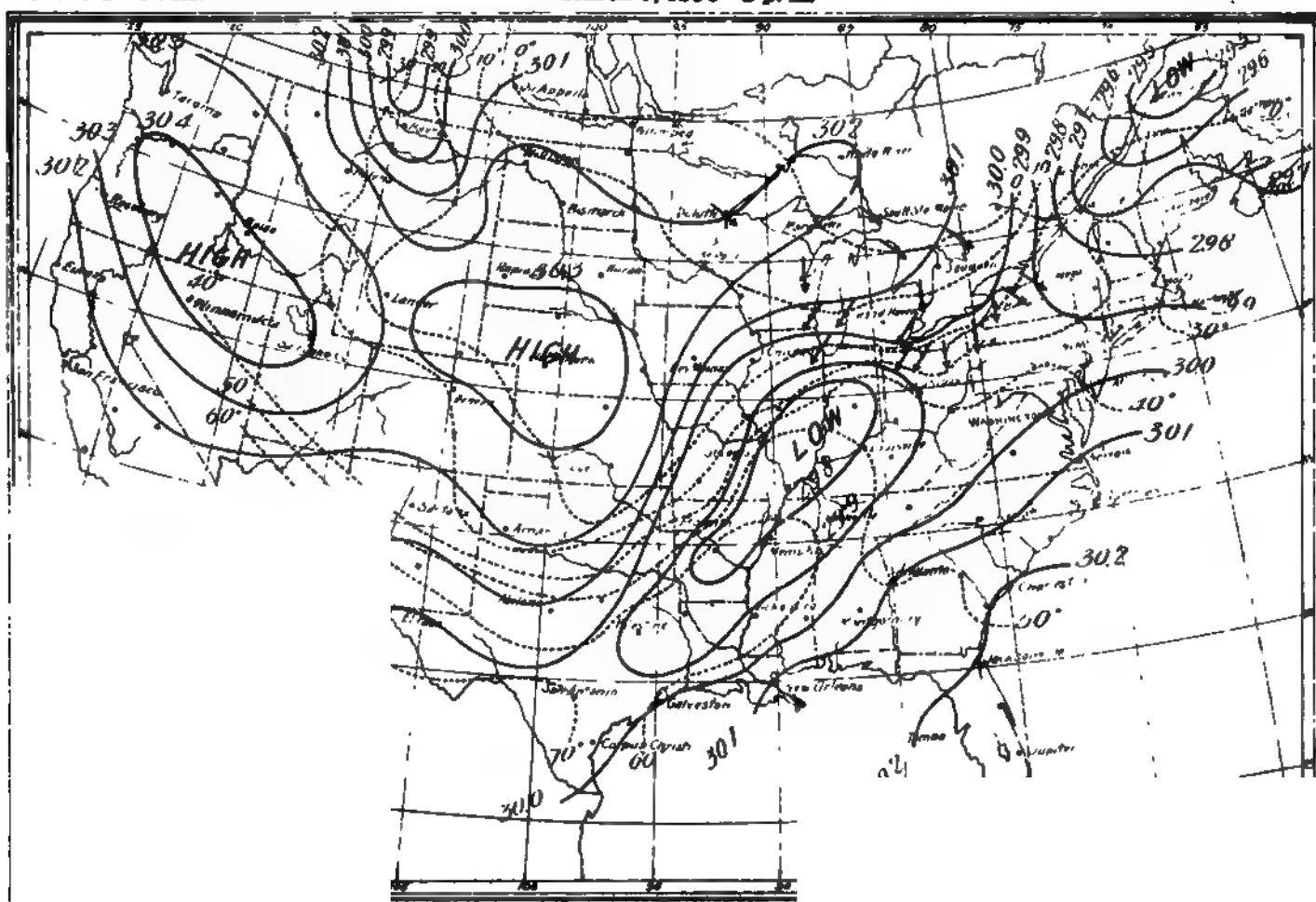


Chart OXOIX.

March 4, 1895—8 a. m.

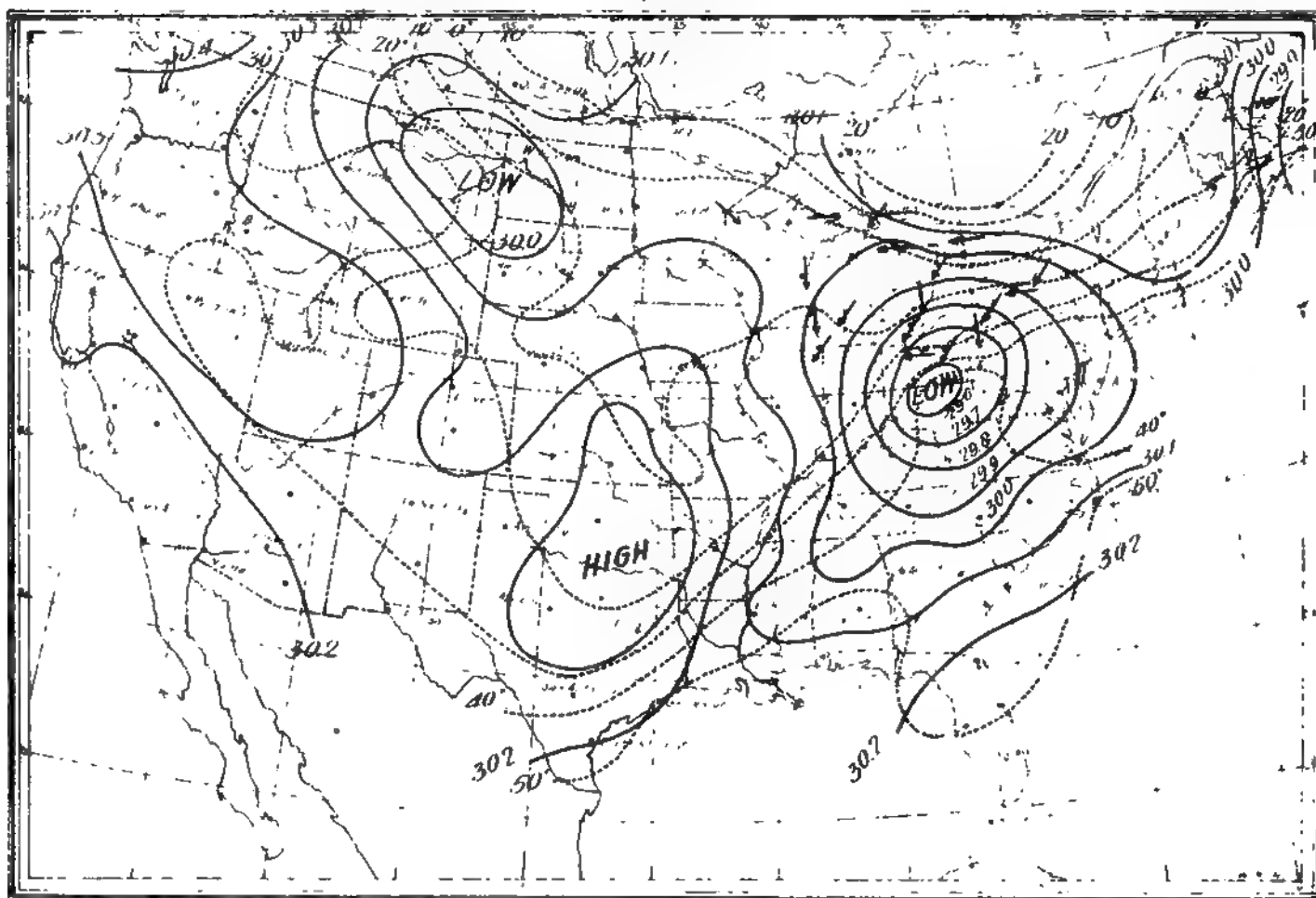


Chart OO.

March 4, 1895—8 p. m.

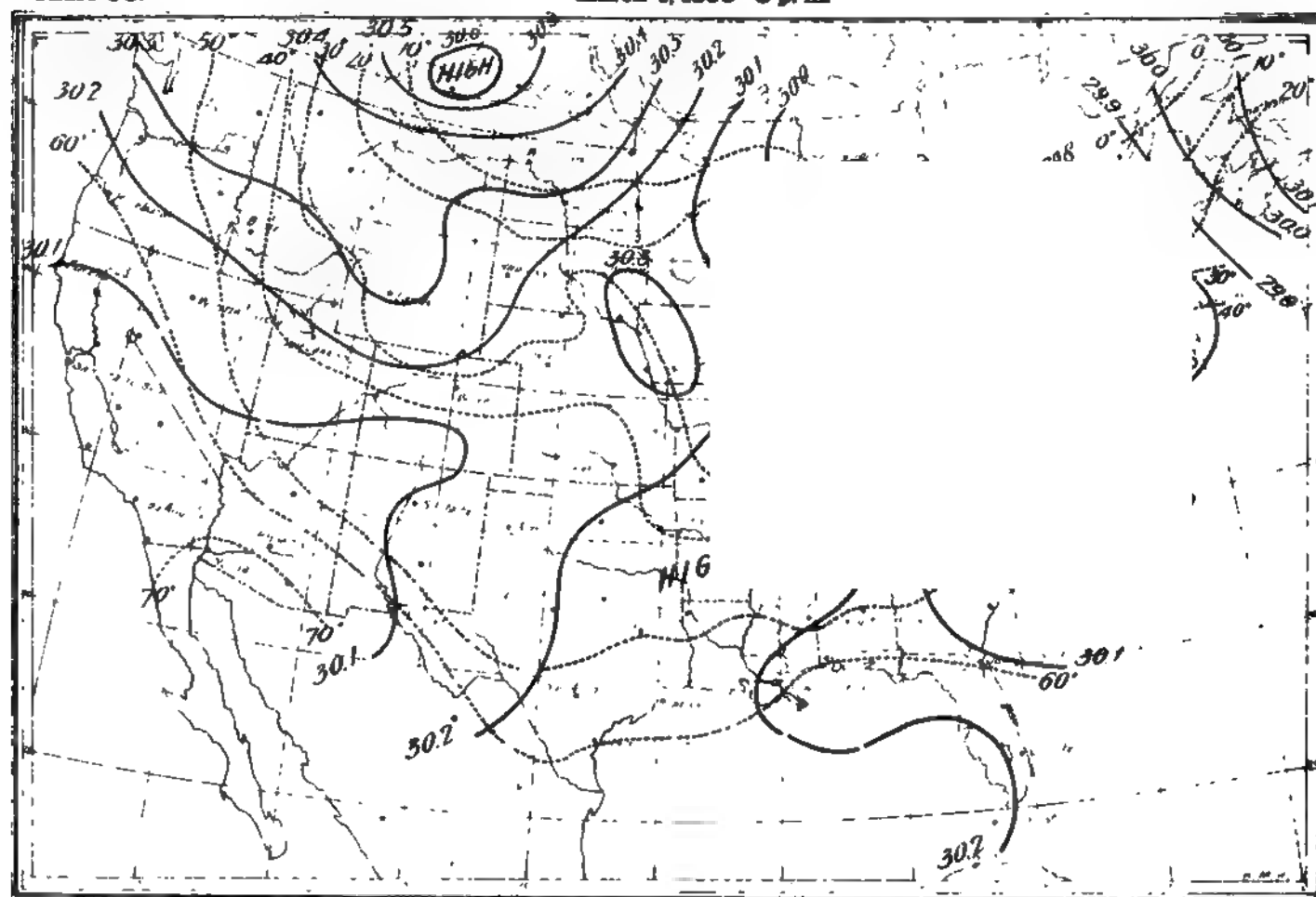


Chart OOL

March 27, 1896—8 p. m.

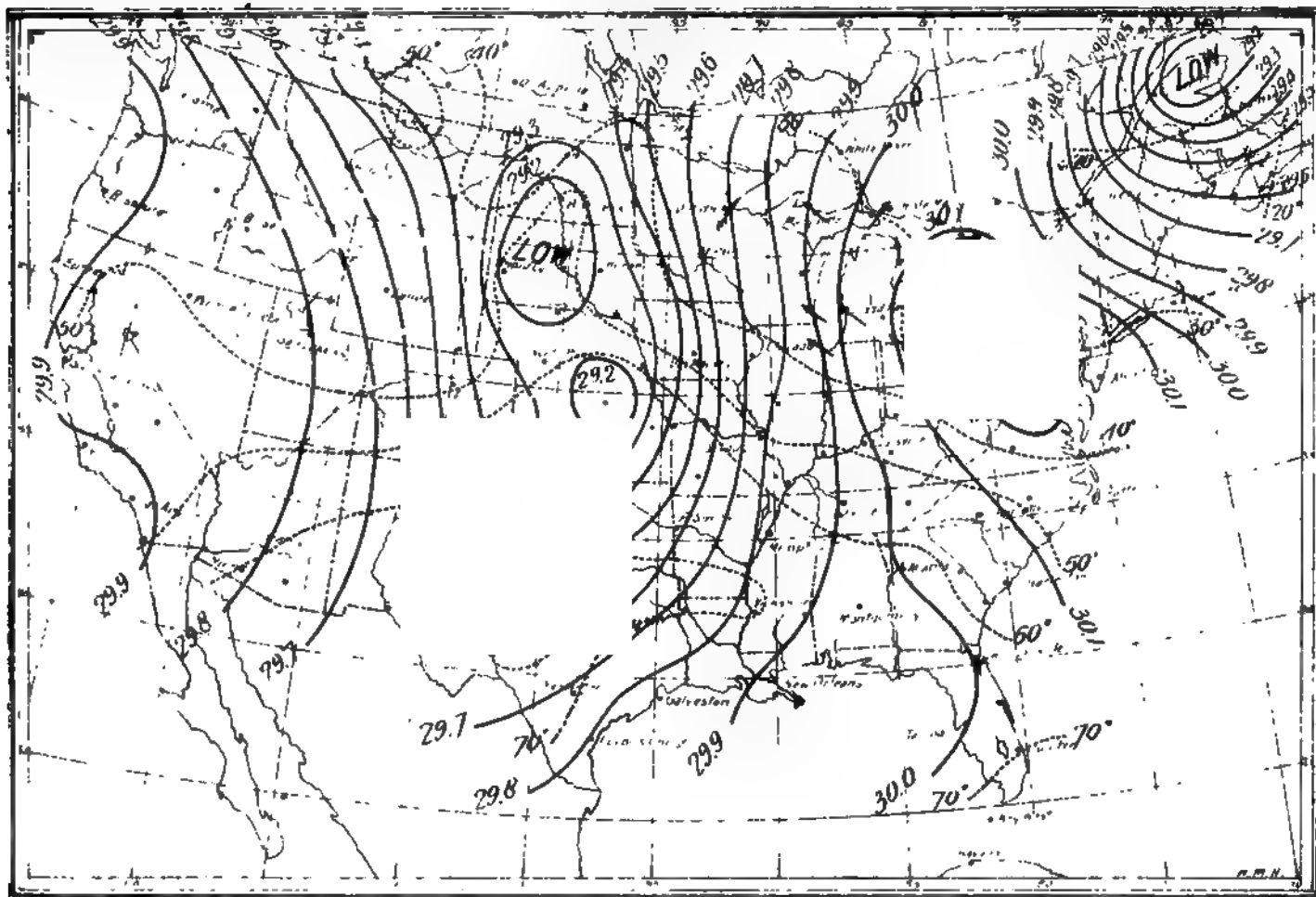


Chart OOL

March 28, 1896—8 a. m.

Chart OCIII.

March 28, 1896—8 p. m.

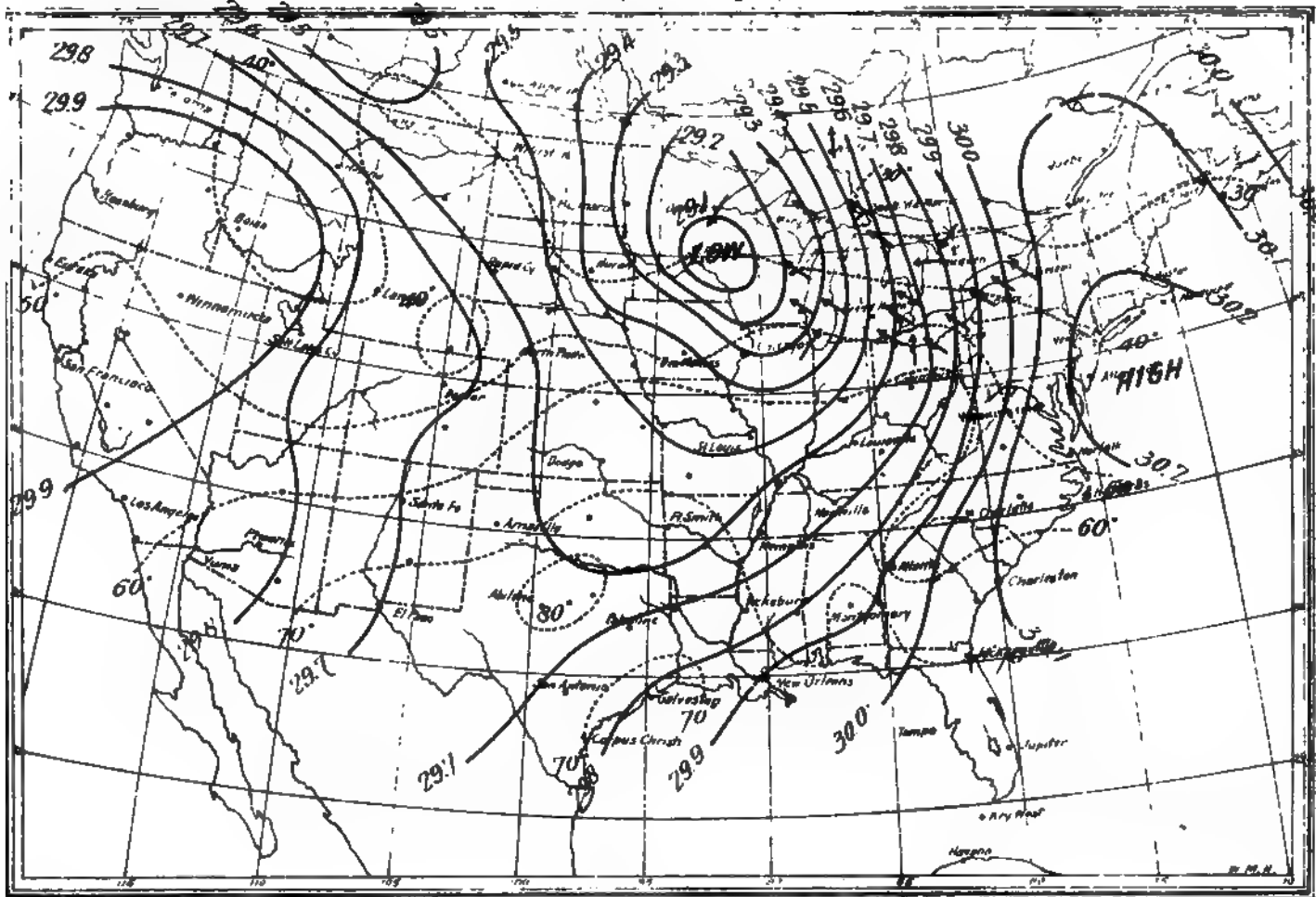


Chart OCIV.

March 29, 1896—8 a. m.

Chart OOV.

March 8, 1897—8 a. m.

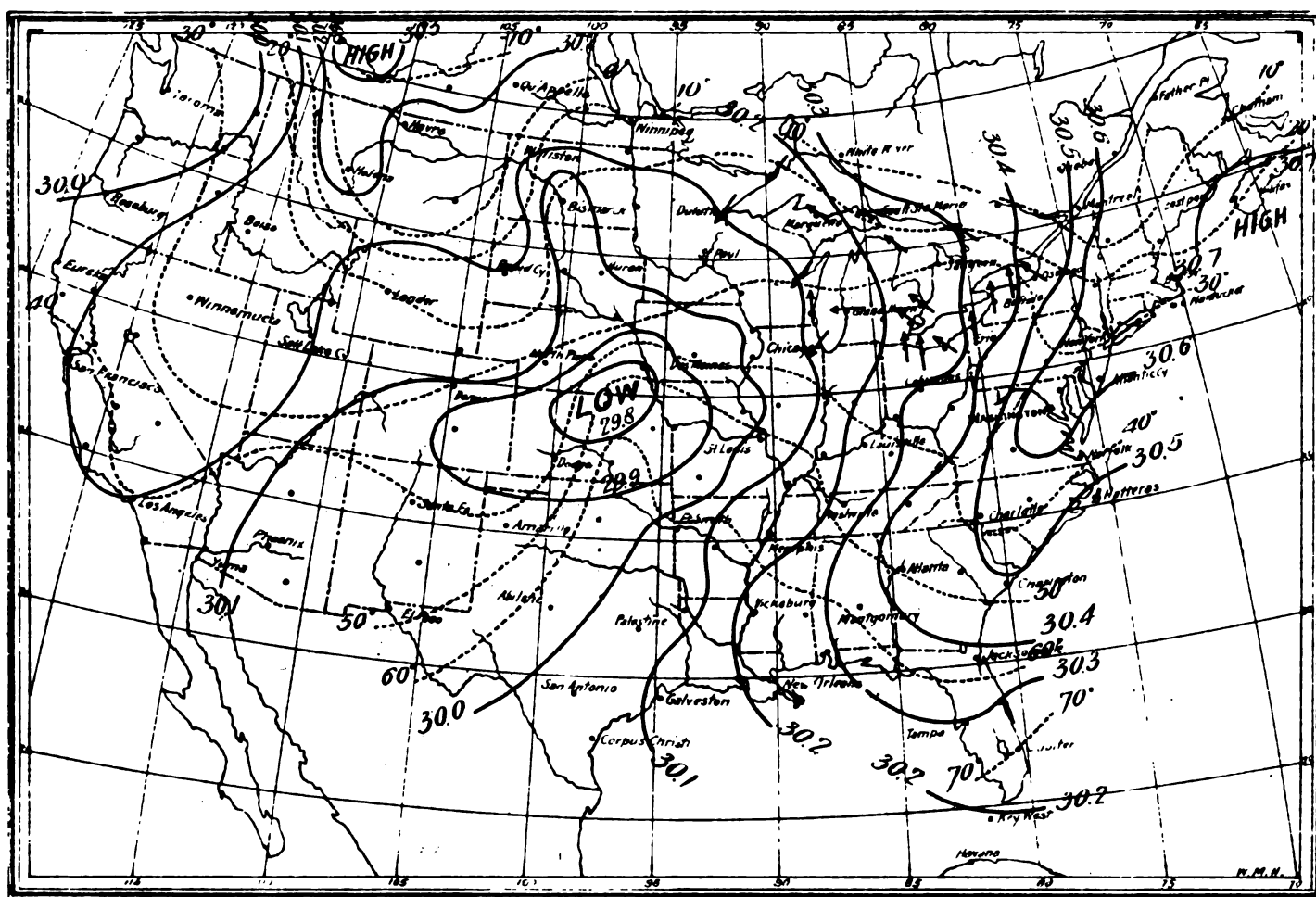


Chart OOV1.

March 8, 1897—8 p. m.

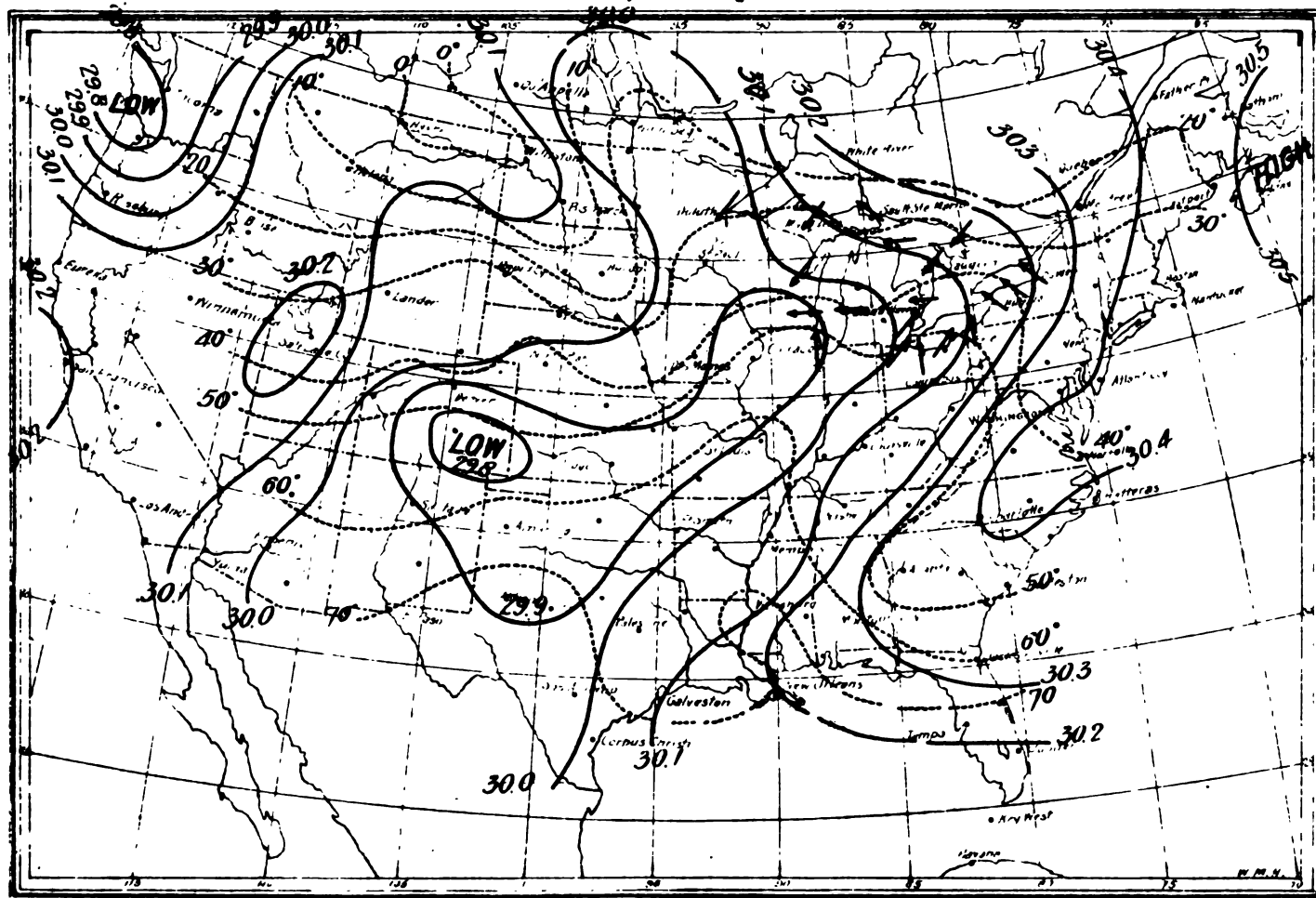


Chart COVII

March 9, 1897—8 a. m.

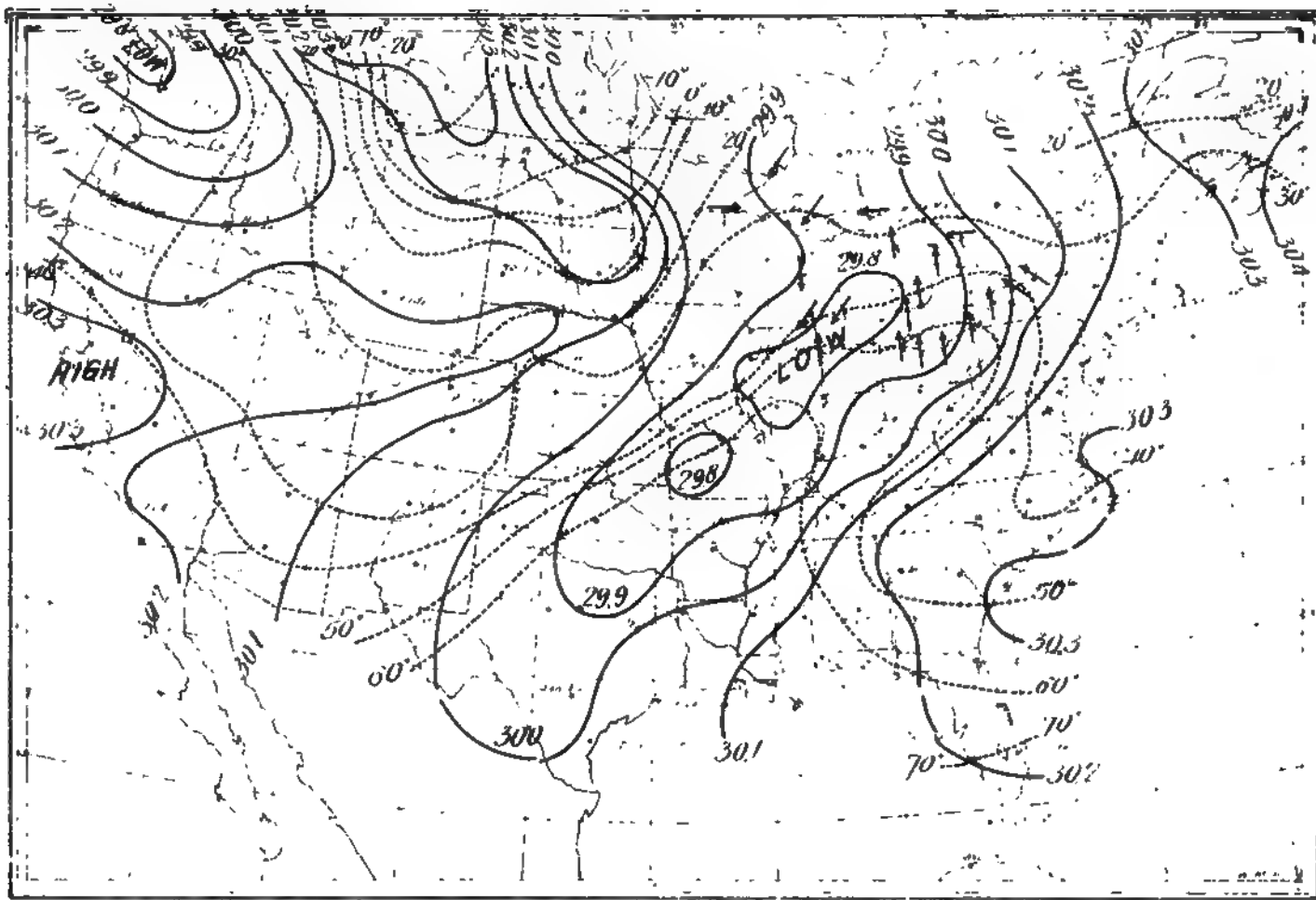


Chart COVIII

March 9, 1897—8 p. m.

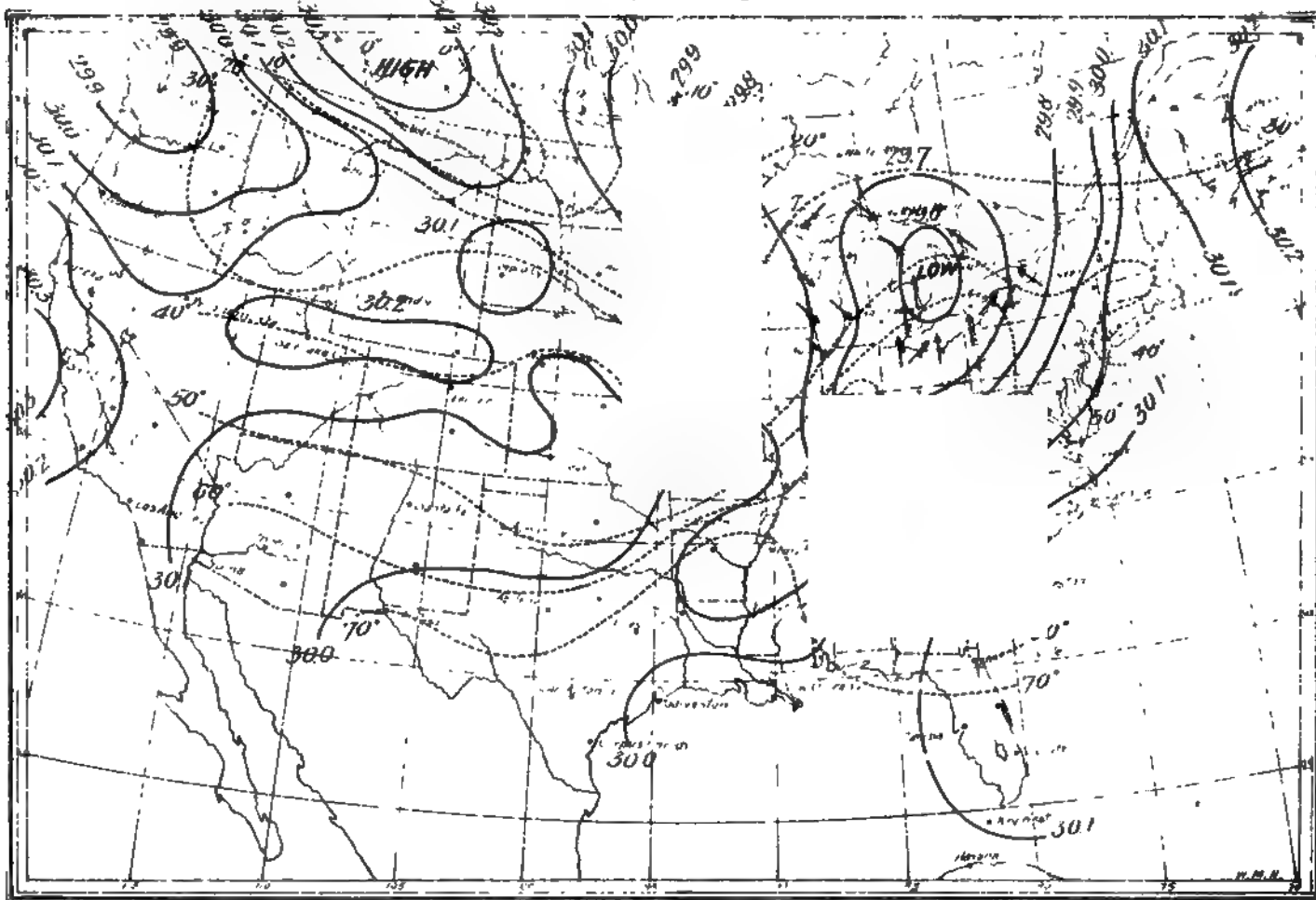


Chart COIX.

March 10, 1897—8 p. m.

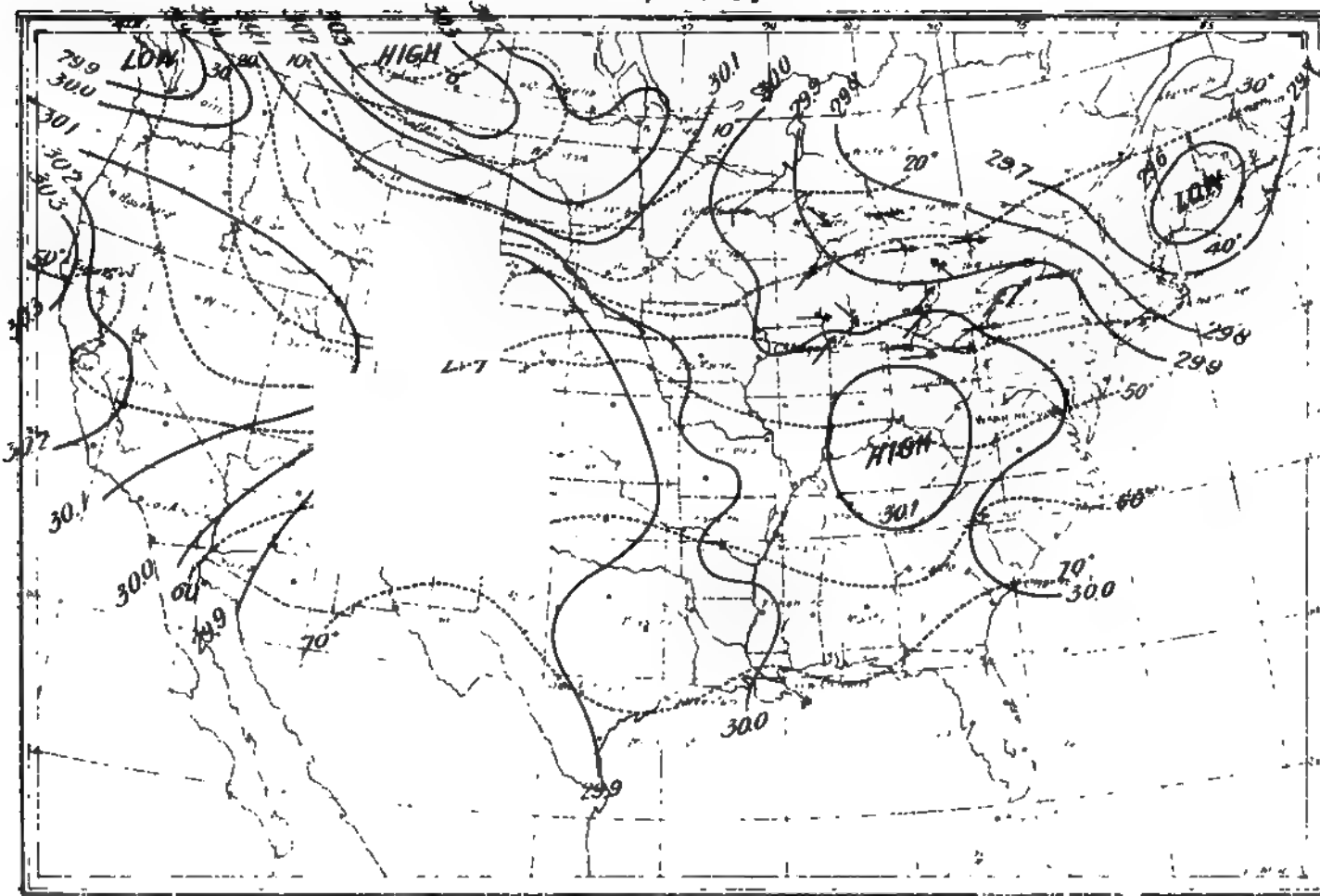


Chart COX.

March 11, 1897—8 a. m.

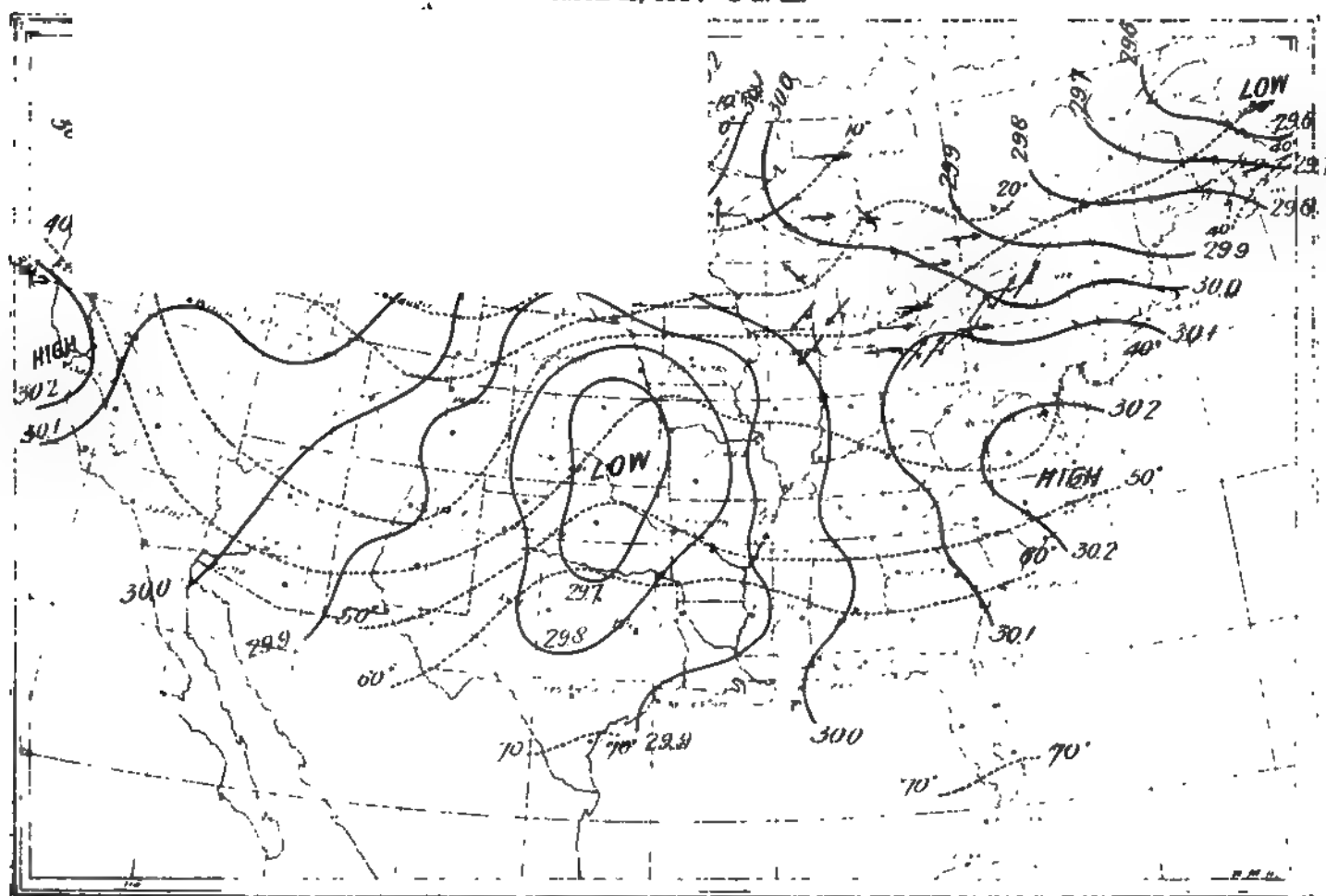


Chart CXXI.

March 11, 1897—8 p. m.

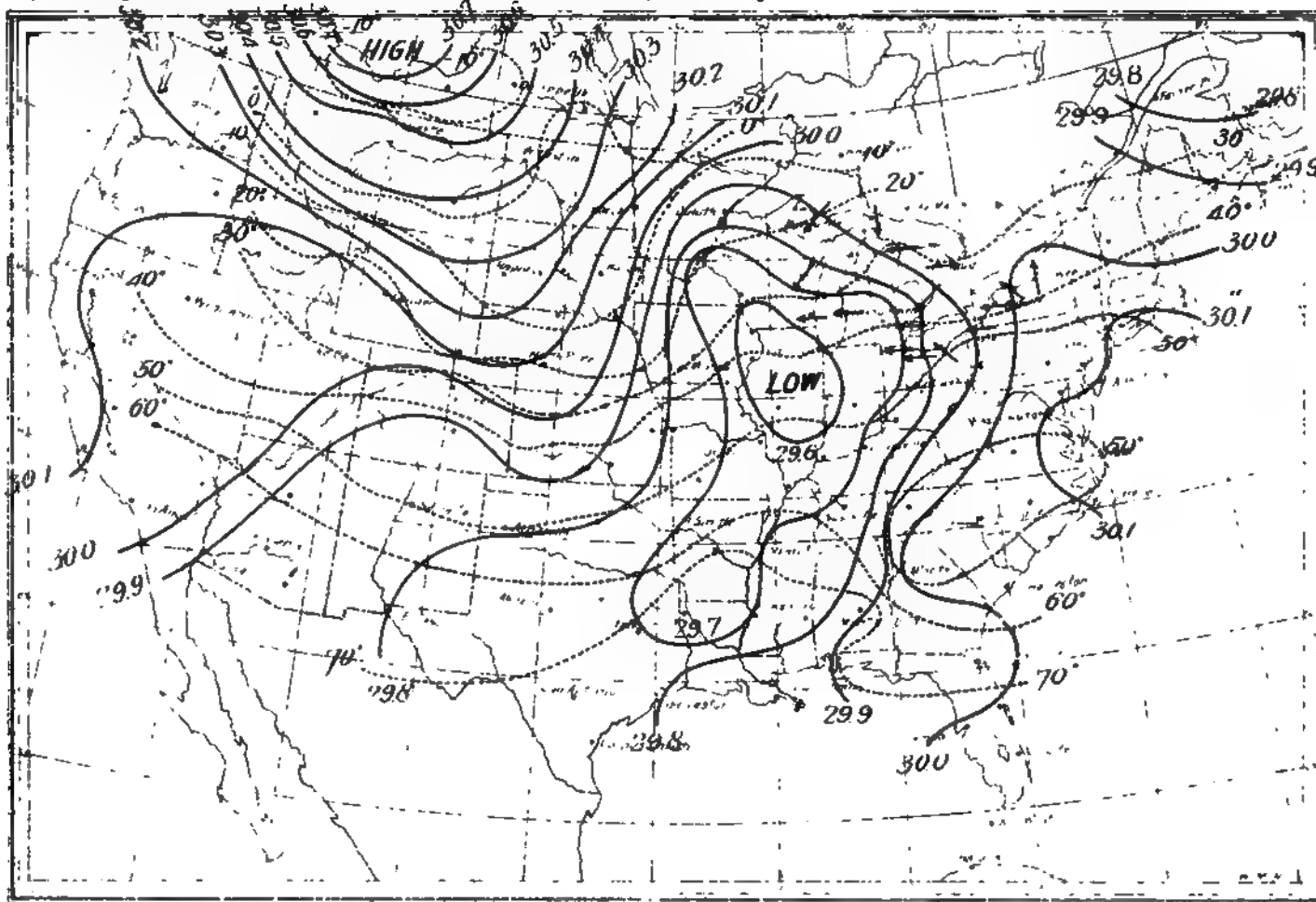


Chart CXXII.

March 12, 1897-8 a. m.

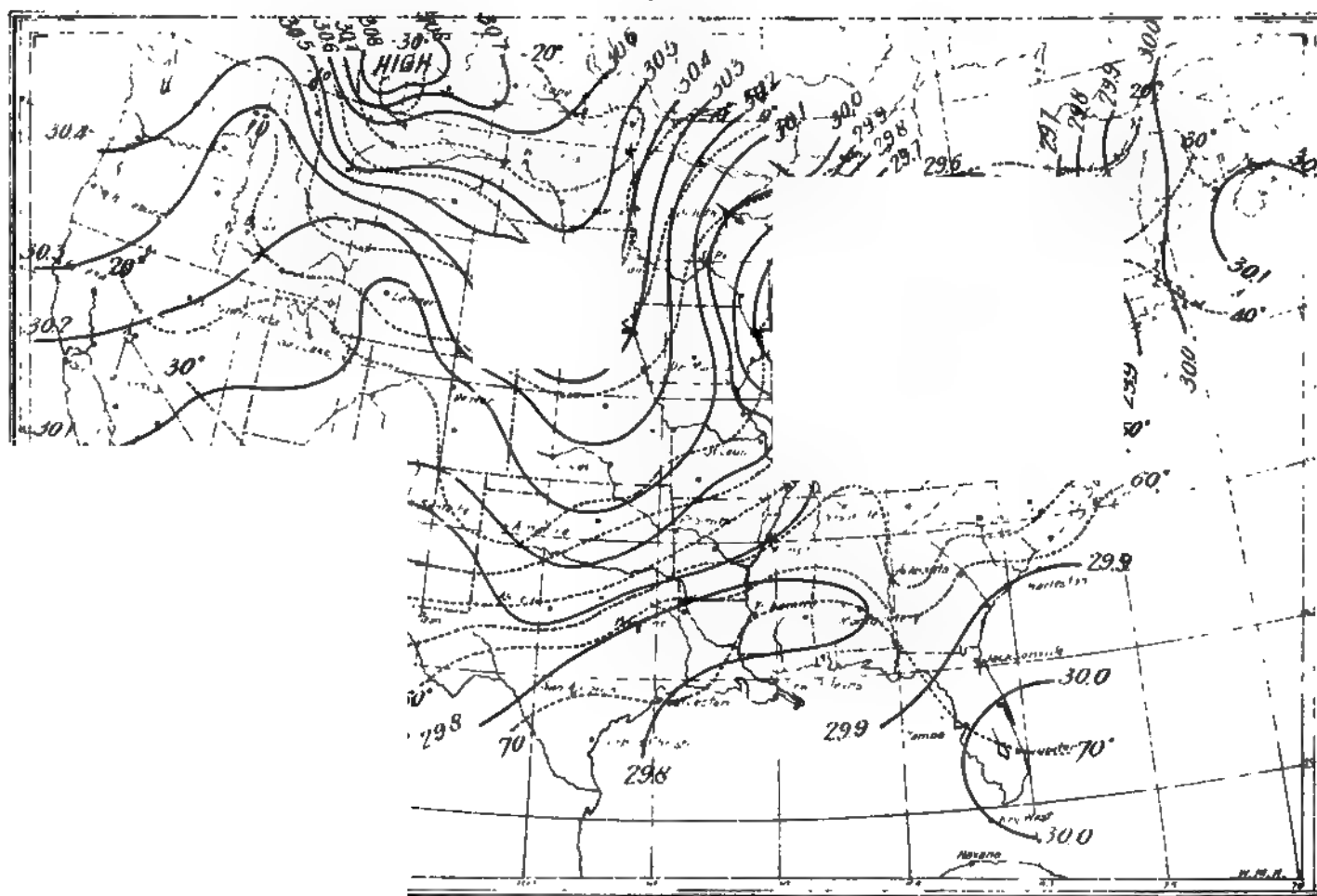


Chart COXIII.

March 18, 1897—8 a. m.

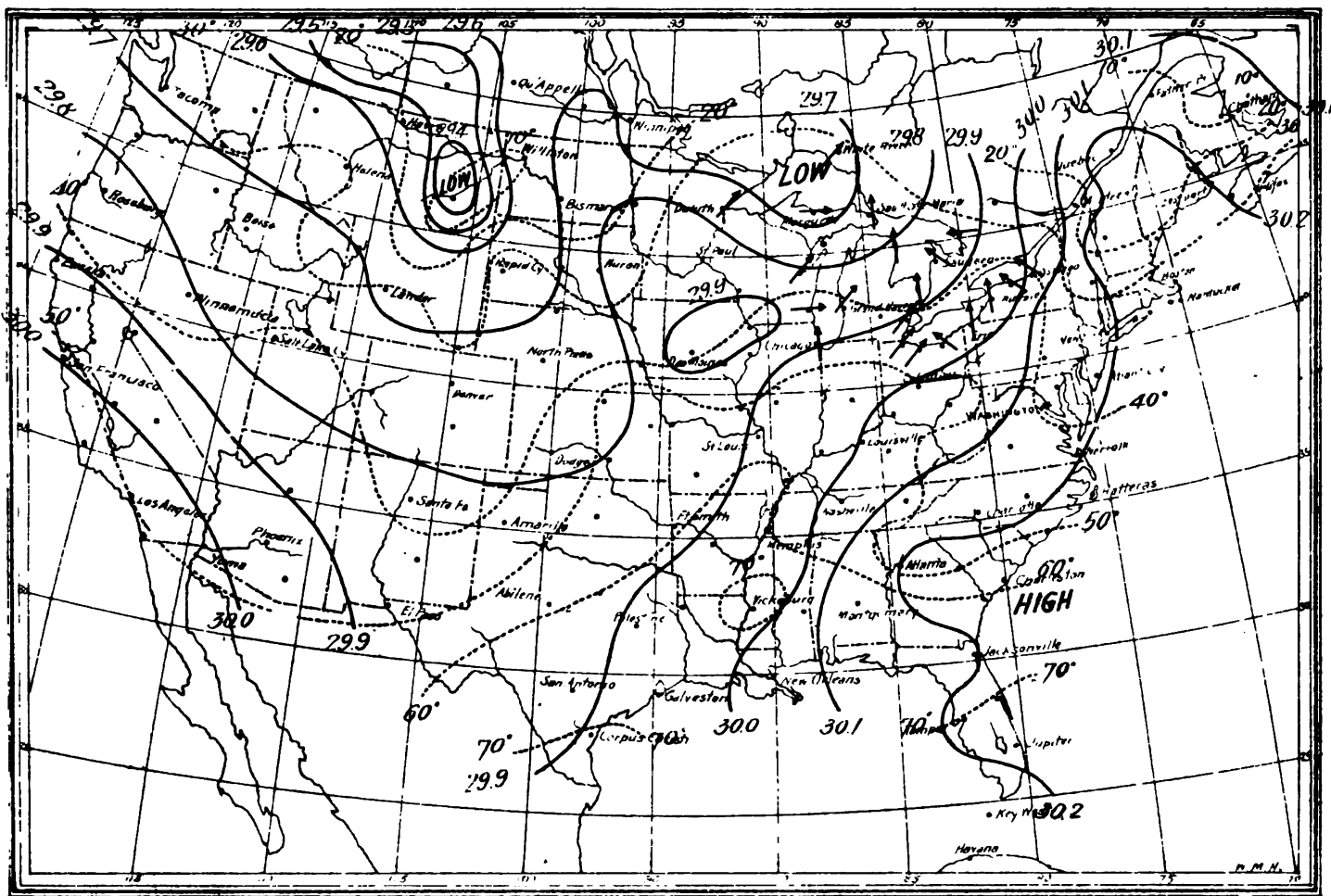


Chart COXIV.

March 18, 1897—8 p. m.

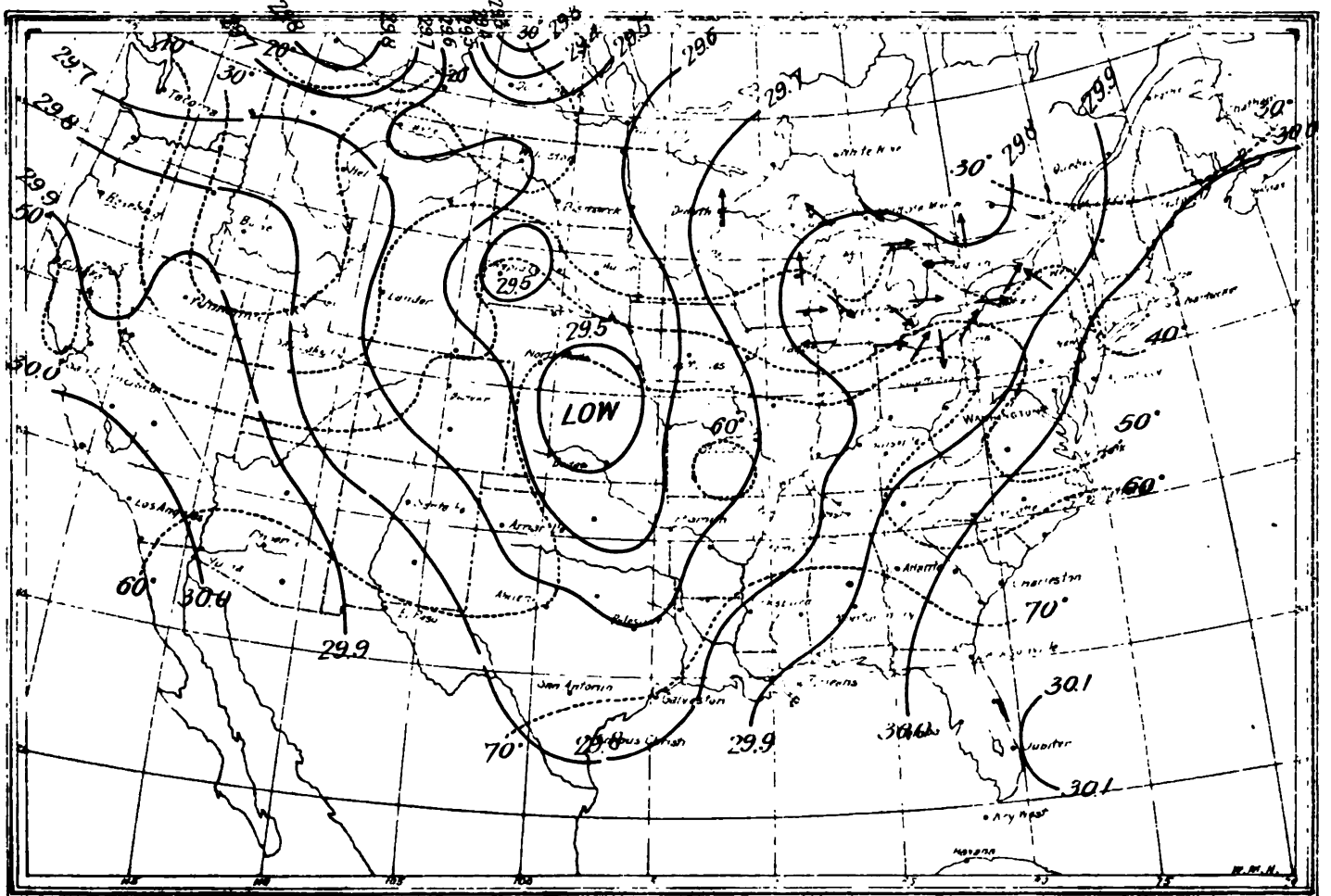


Chart OOXV.

March 19, 1897—8 a. m.

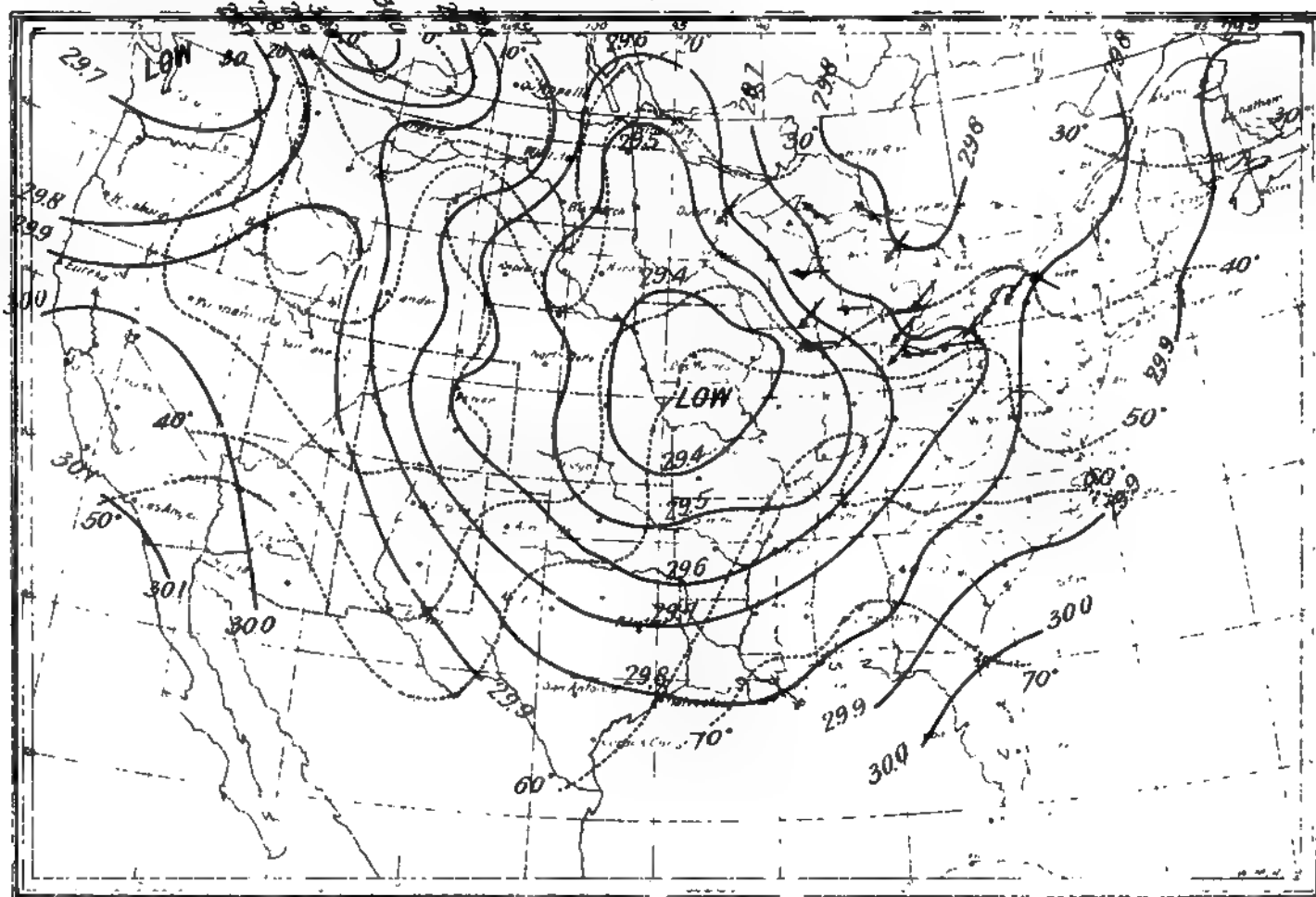


Chart OOXVI.

March 19, 1897—8 p. m.



Chart CXXVII.

March 21, 1898—8 a. m.

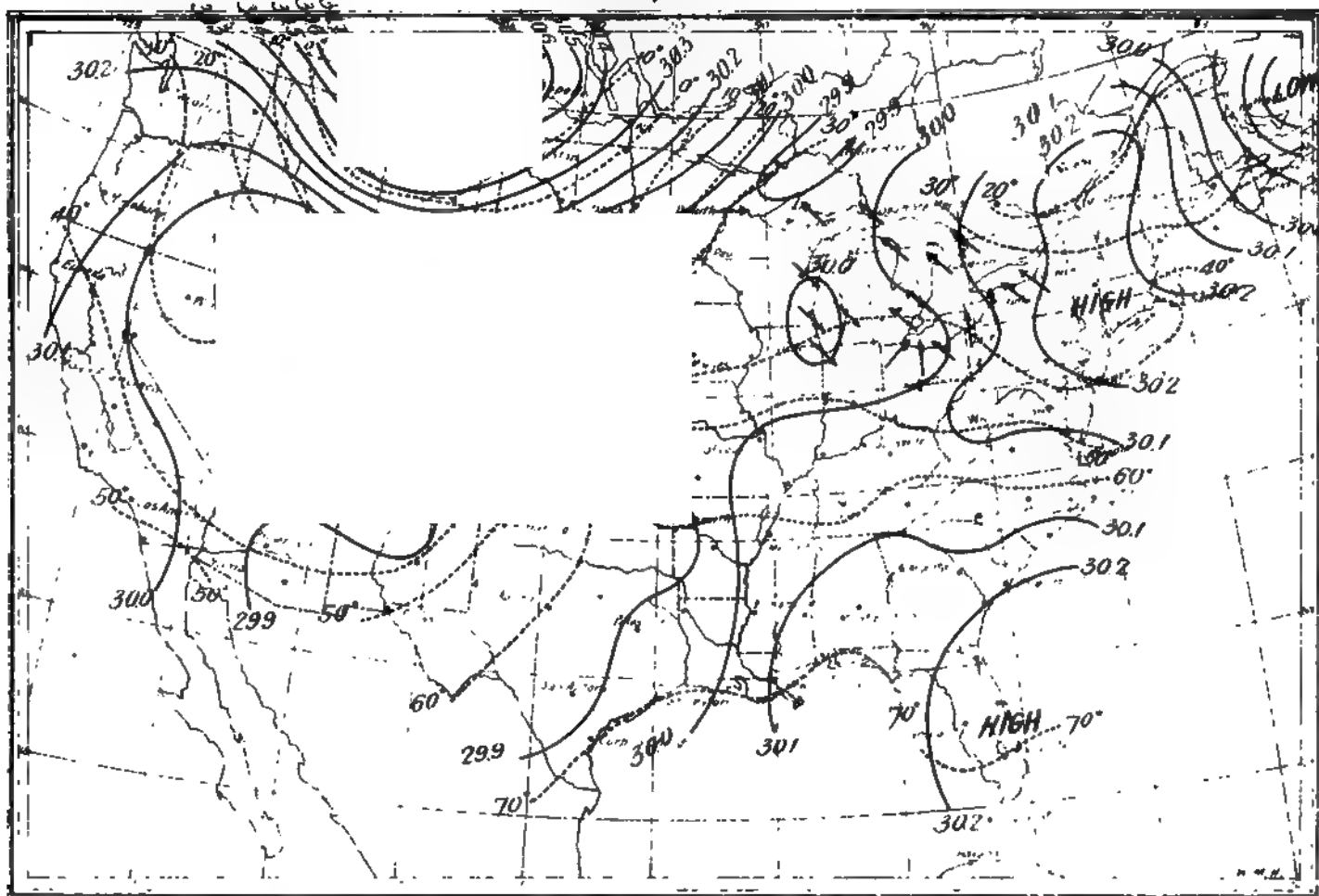
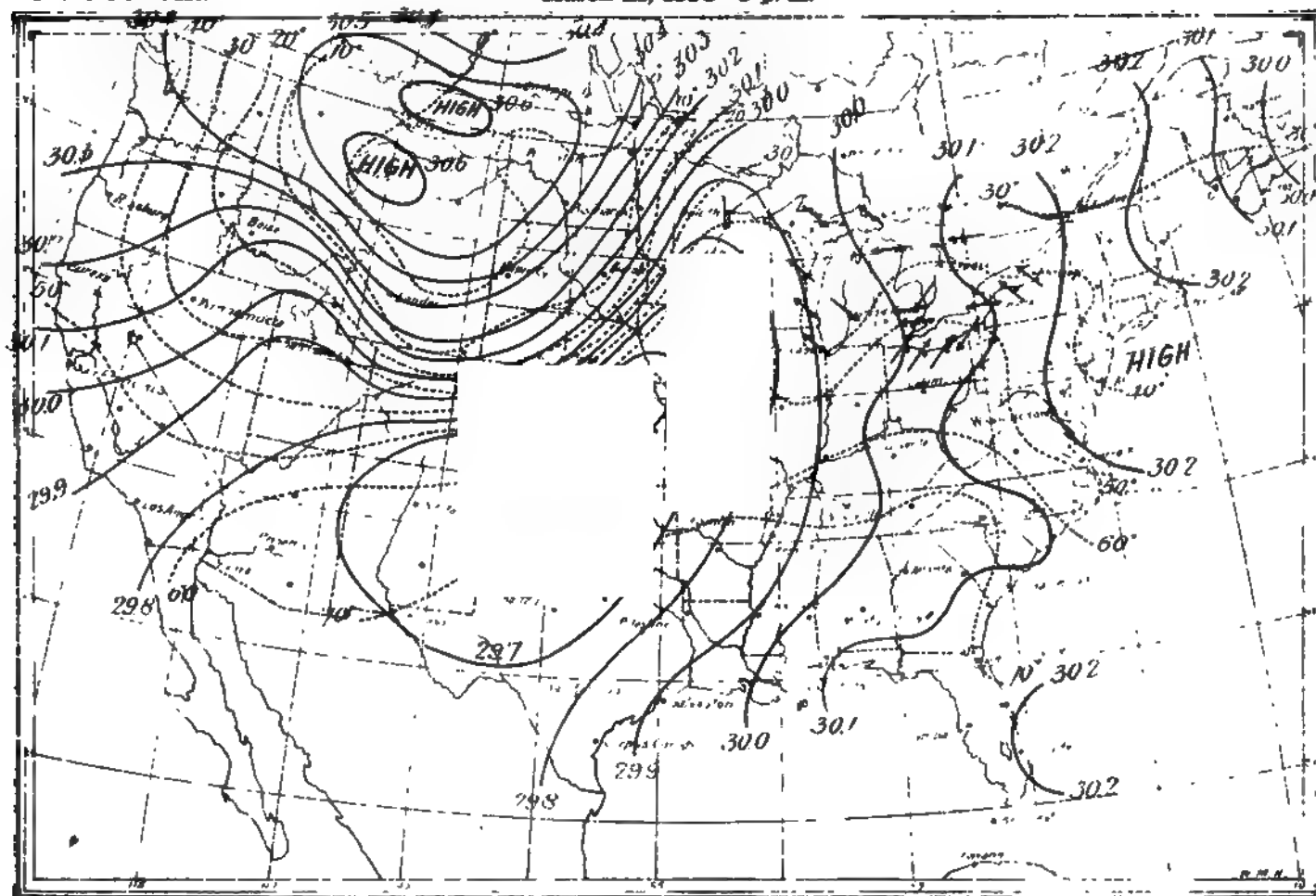
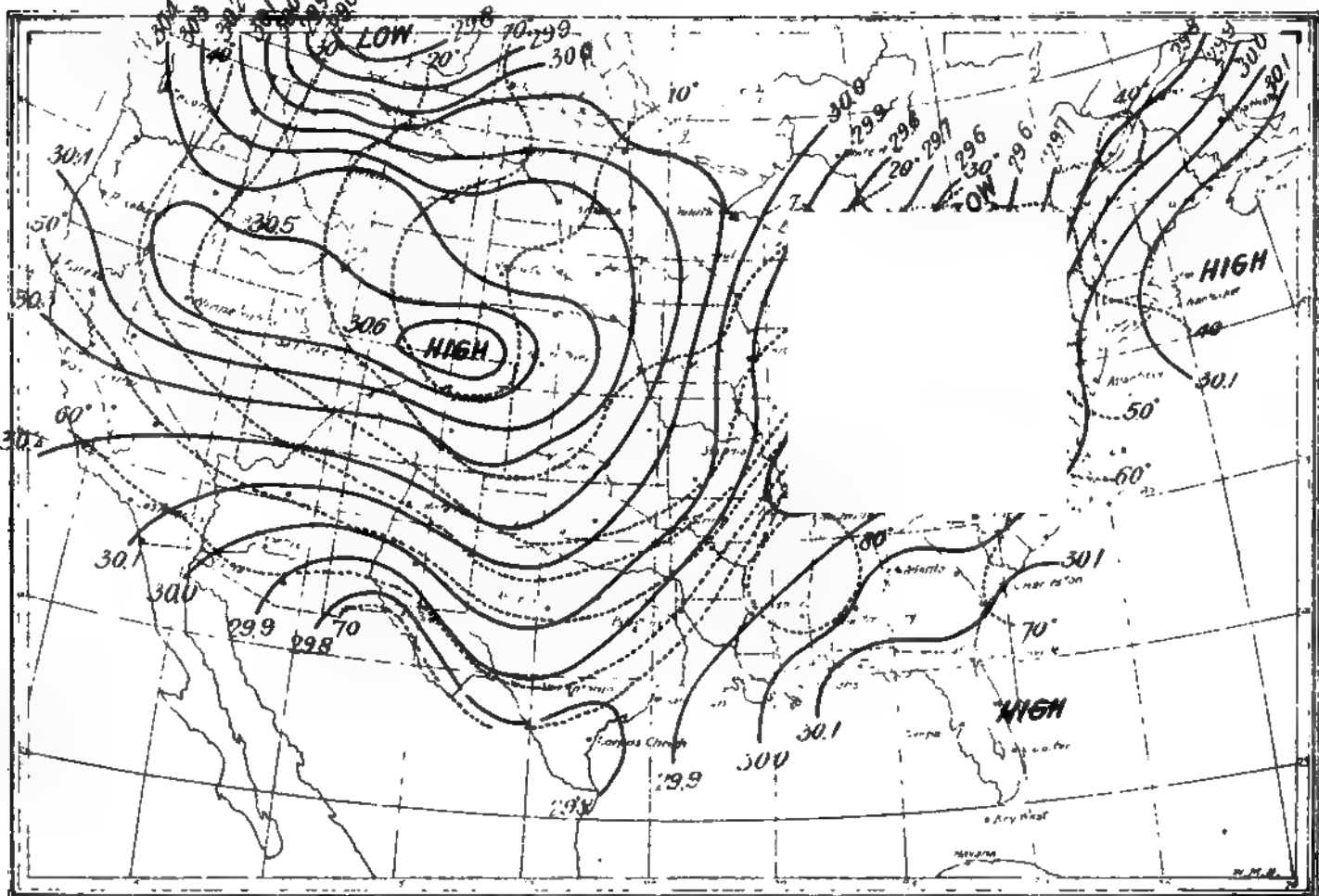
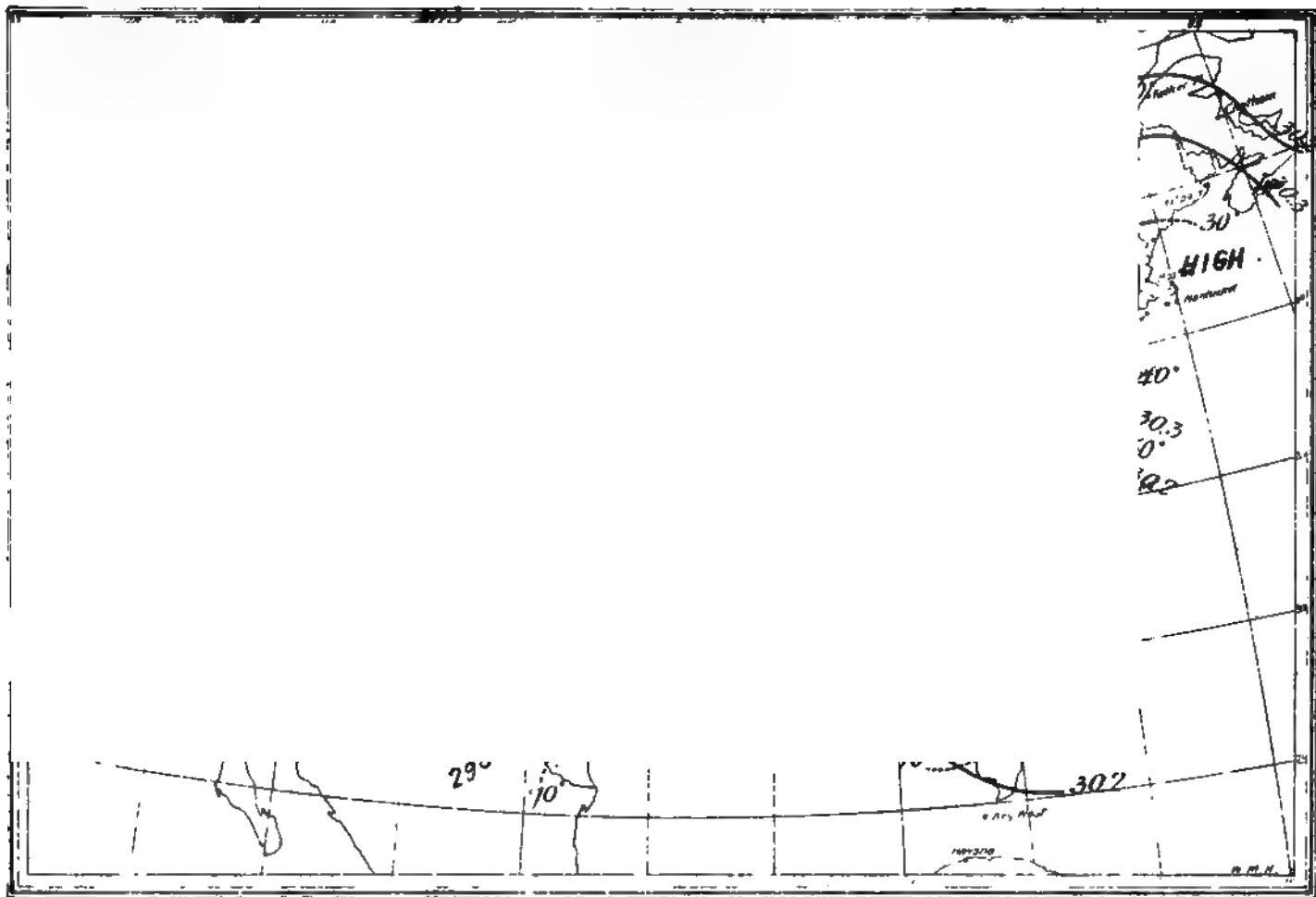
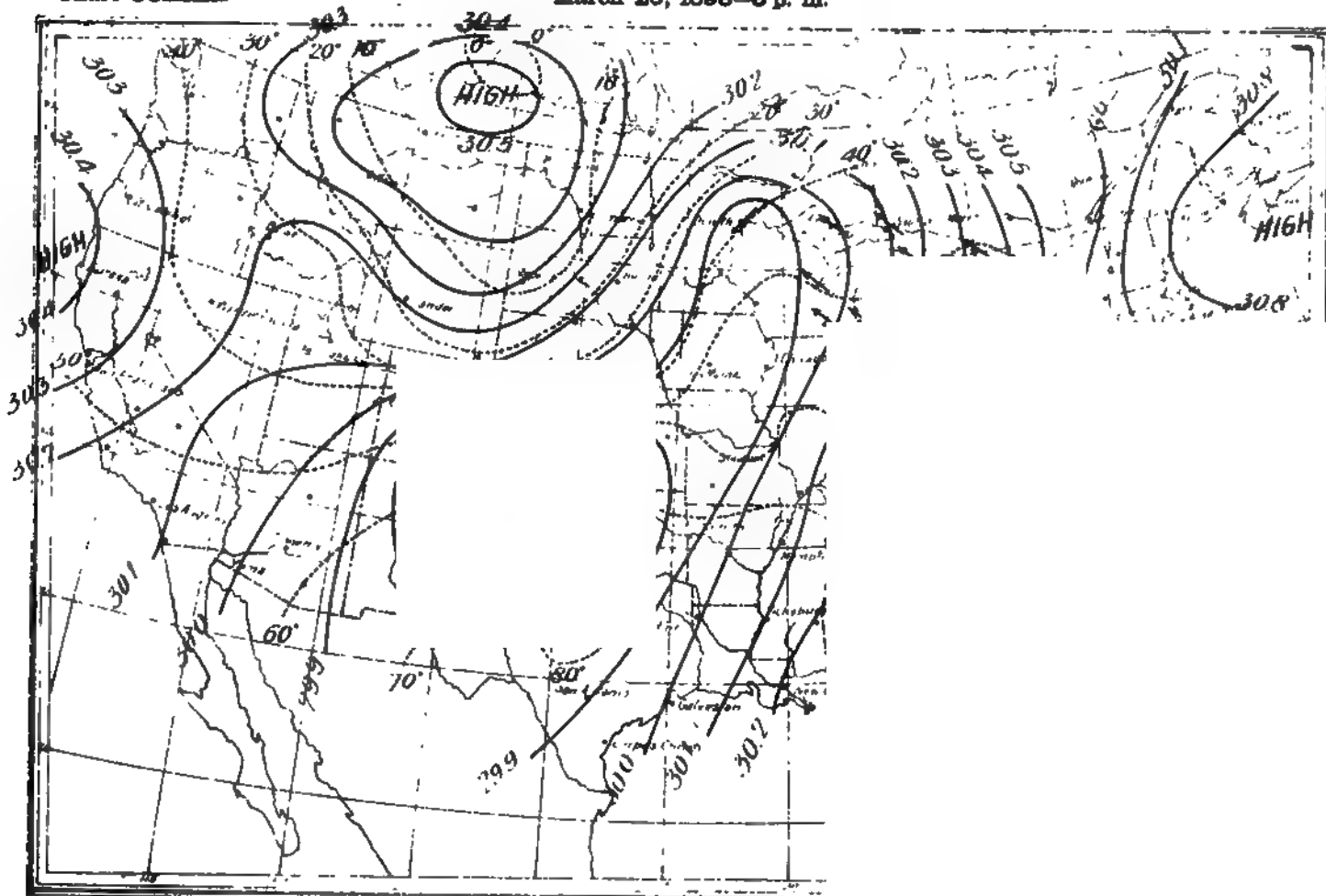
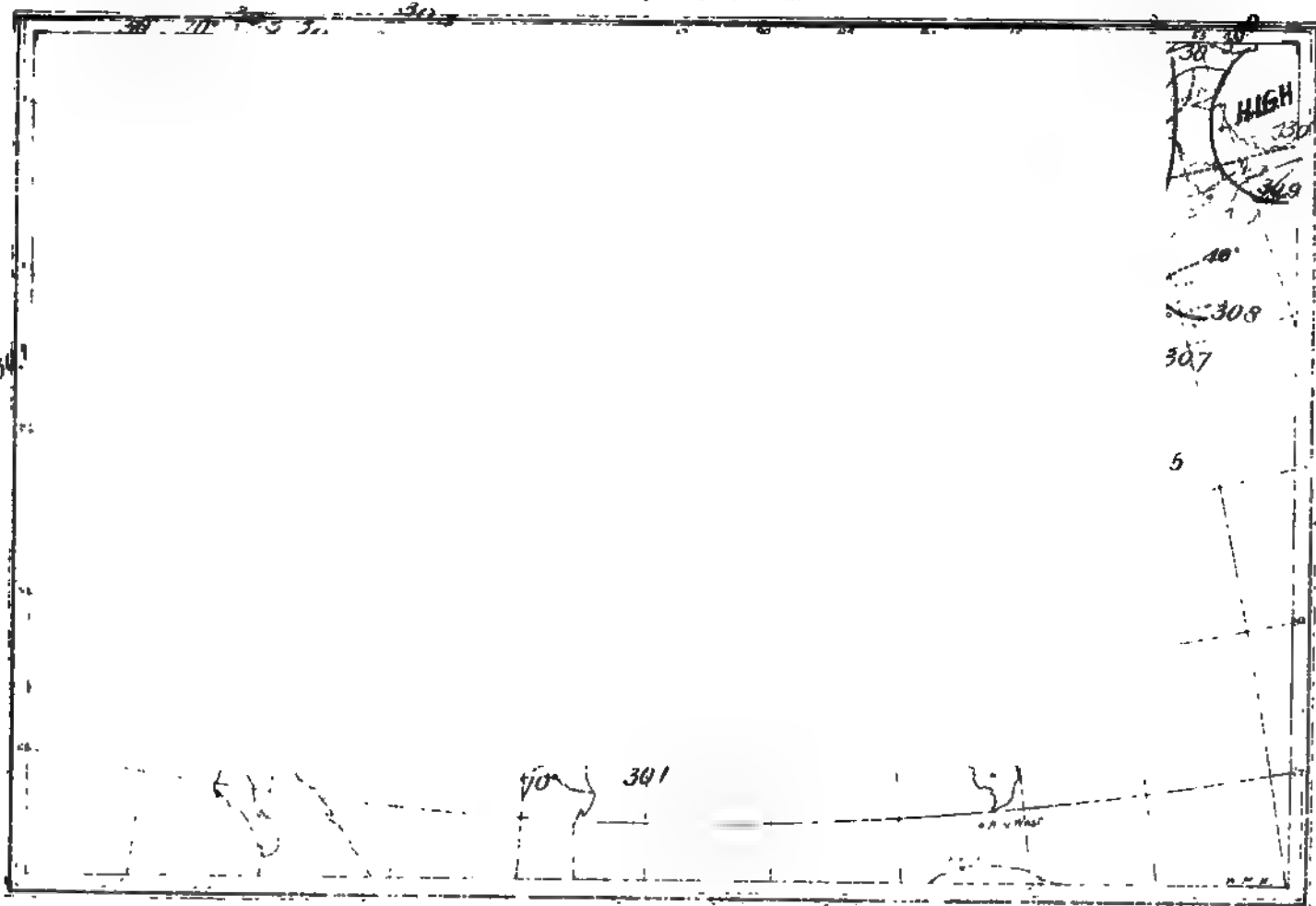


Chart CXXVIII.

March 21, 1898—8 p. m.







Part CCXXIII.

March 27, 1898—8 a. m.

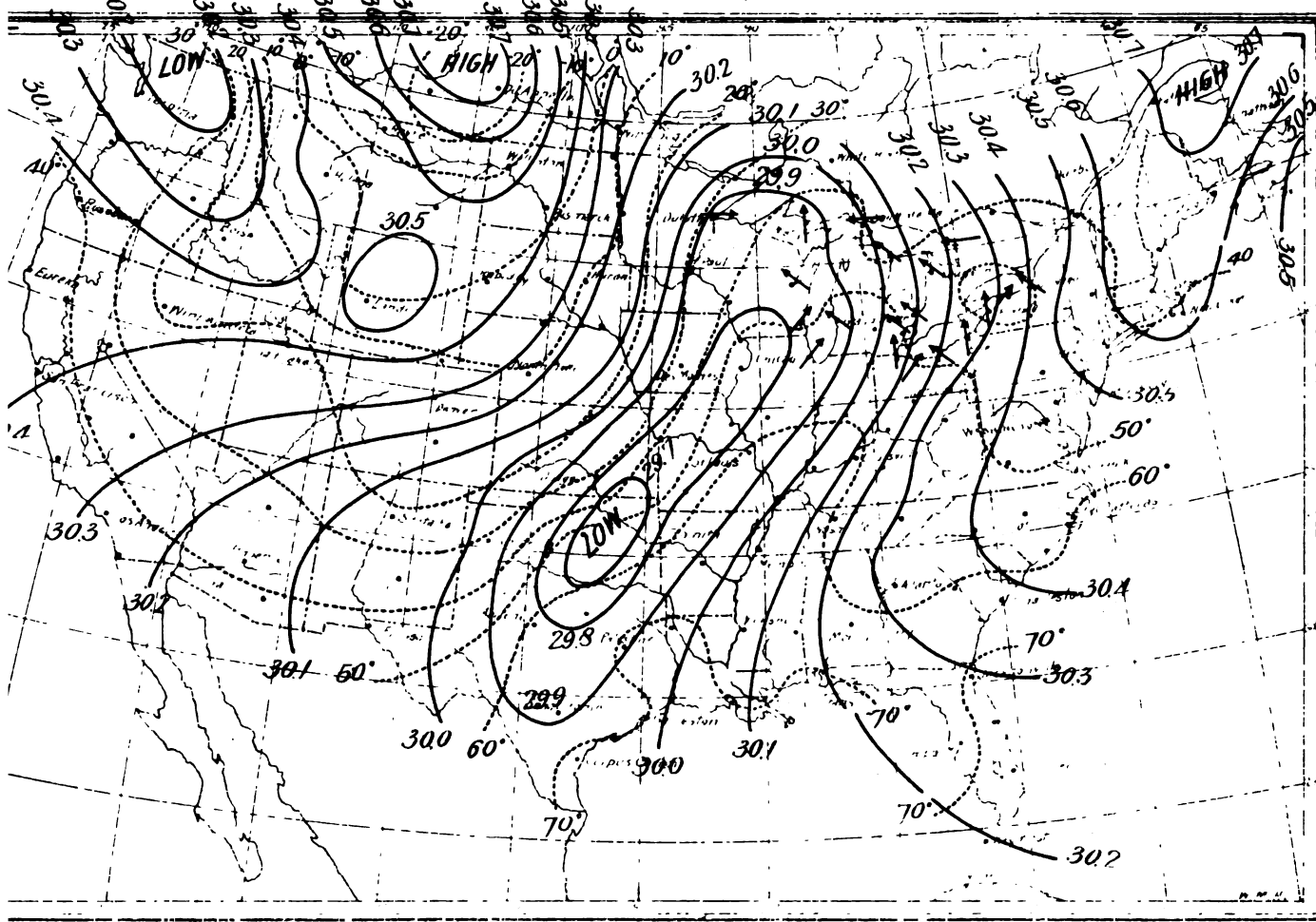


Chart CCXXIV.

March 27, 1898—8 p. m.

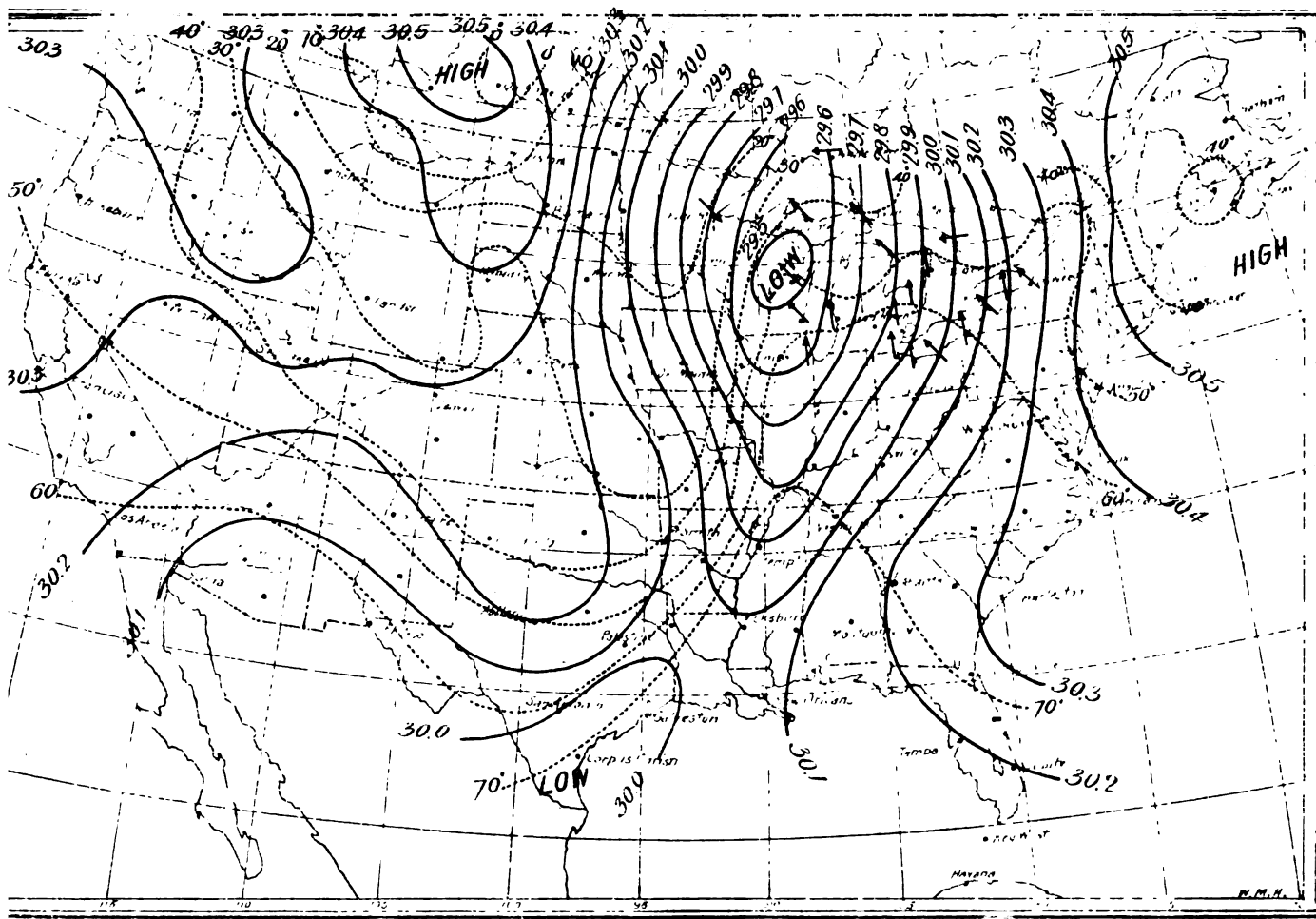


Chart CXXXV.

April 4, 1876-7:35 a. m.

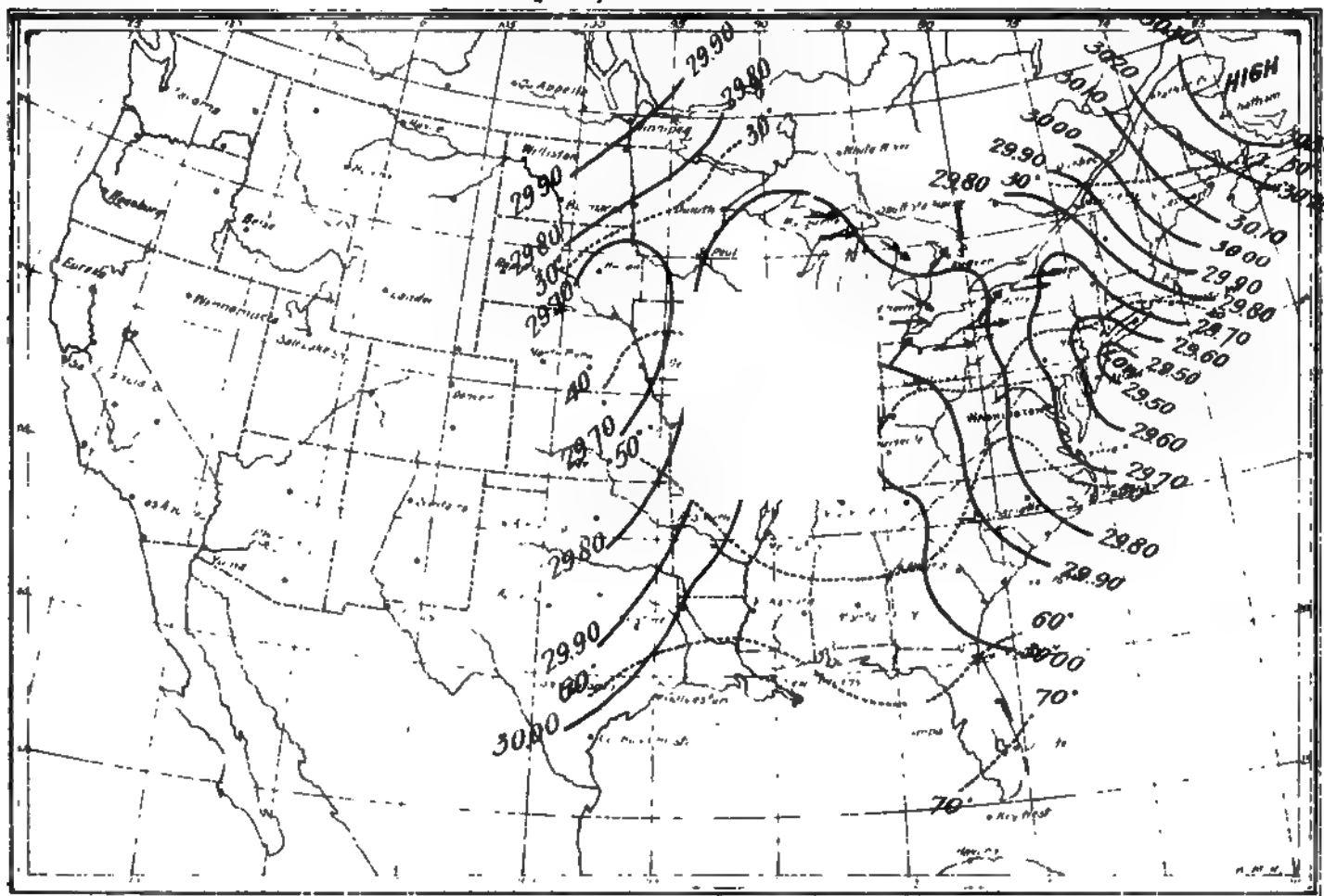


Chart CXXXVI.

April 4, 1876-4:35 p. m.

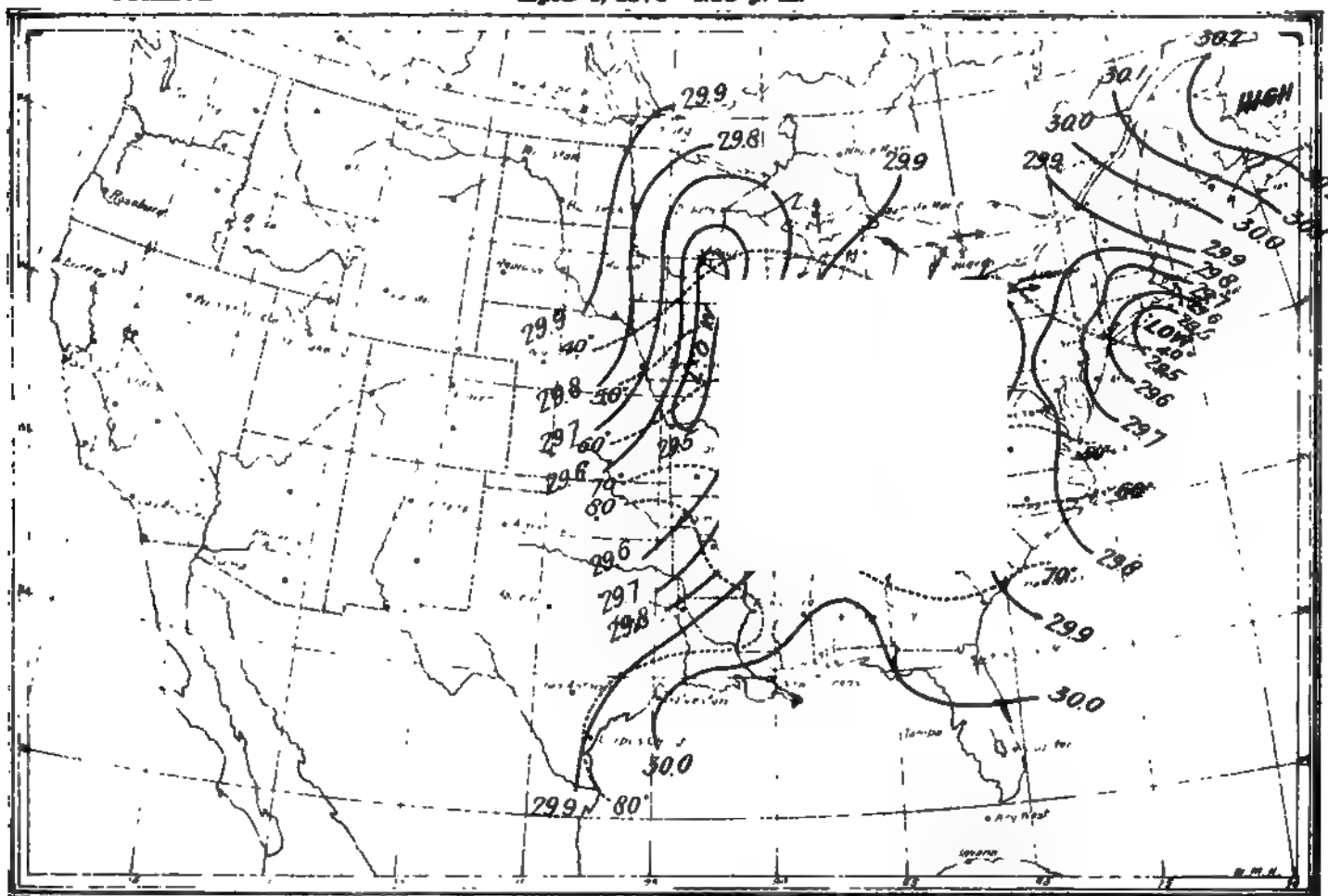


Chart CXXXVII.

April 5, 1876—7:35 a. m.

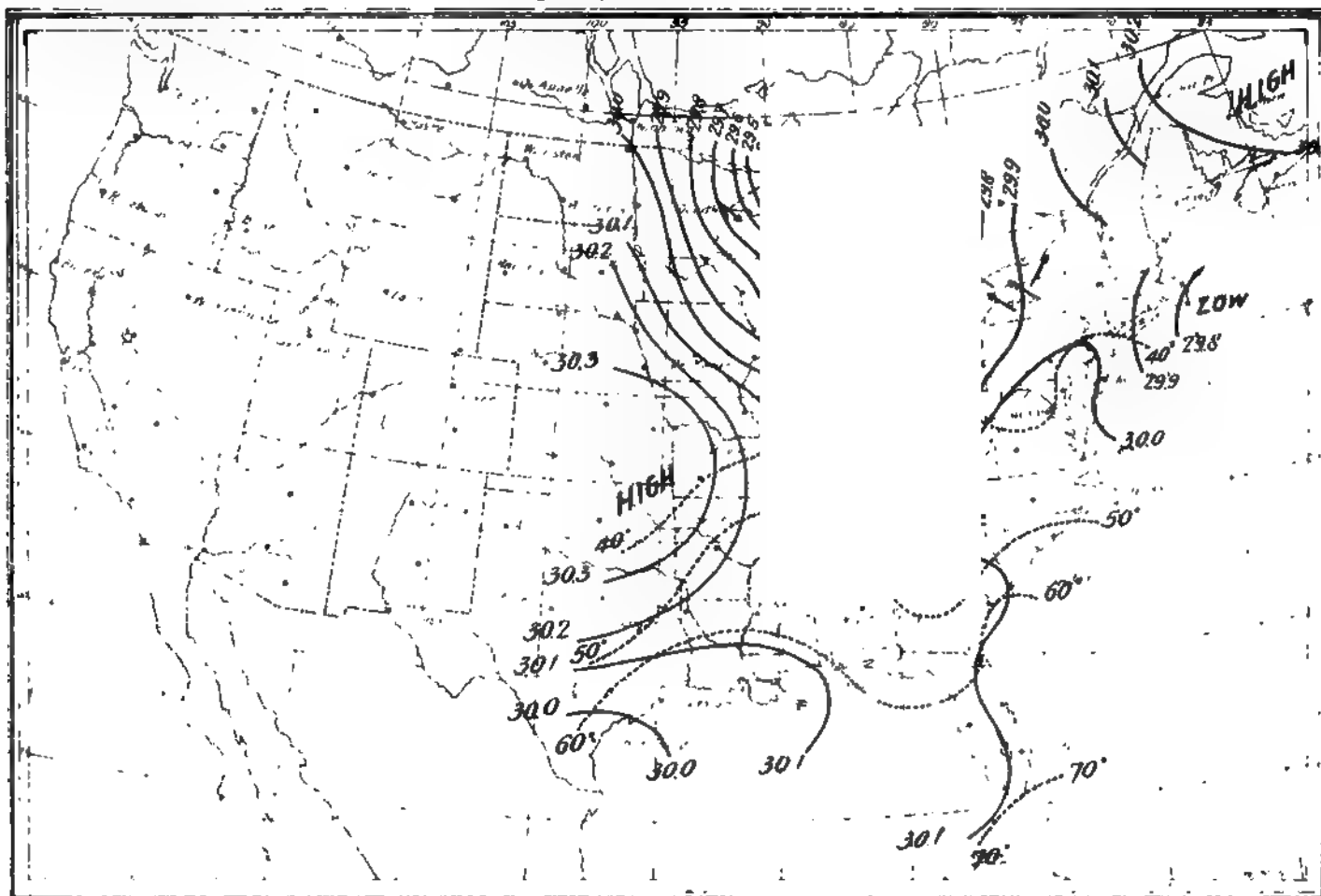


Chart CXXXVIII.

April 5, 1876—4:35 p. m.

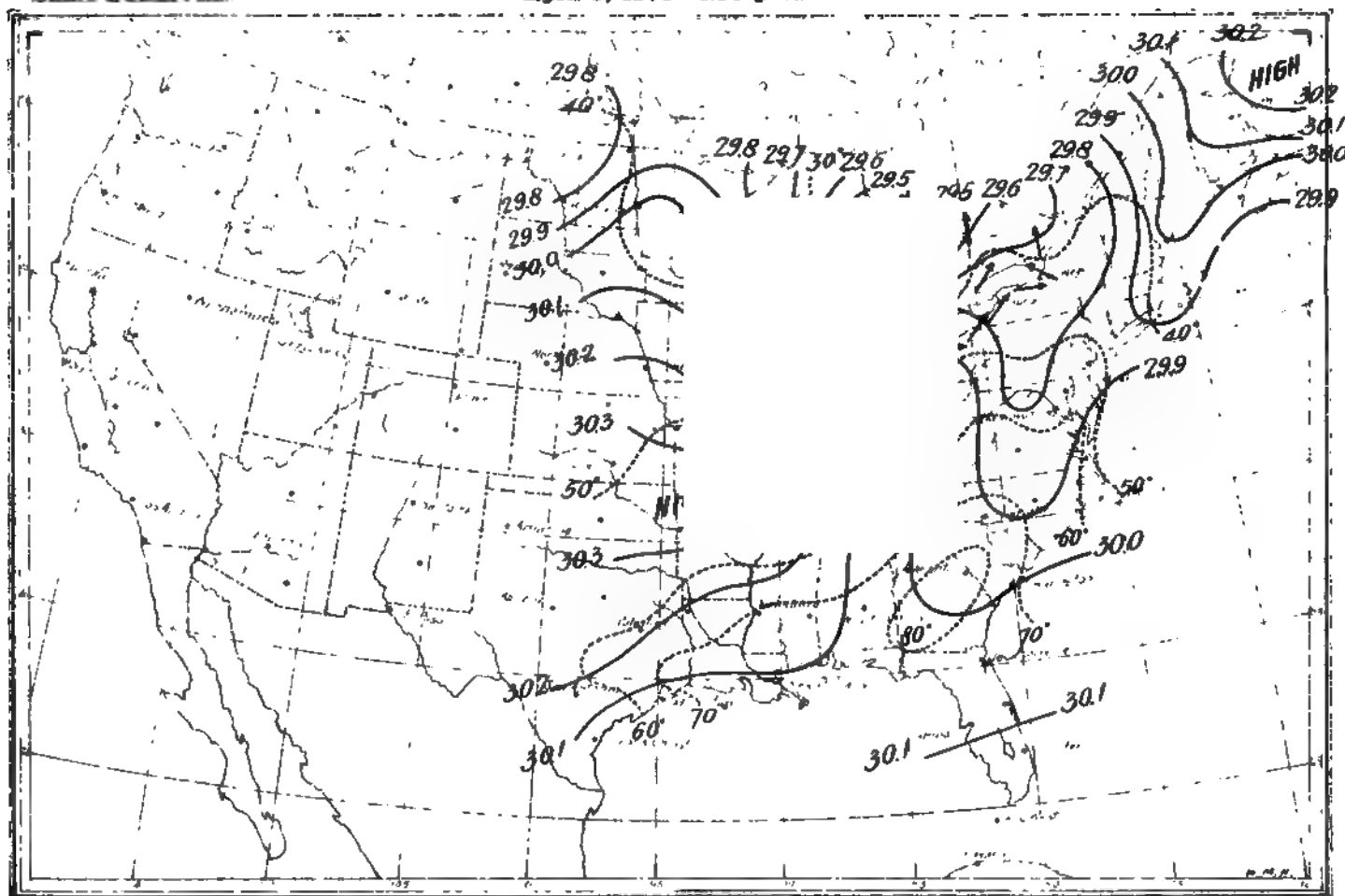


Chart CXXXIX.

April 9, 1878—7:35 a. m.

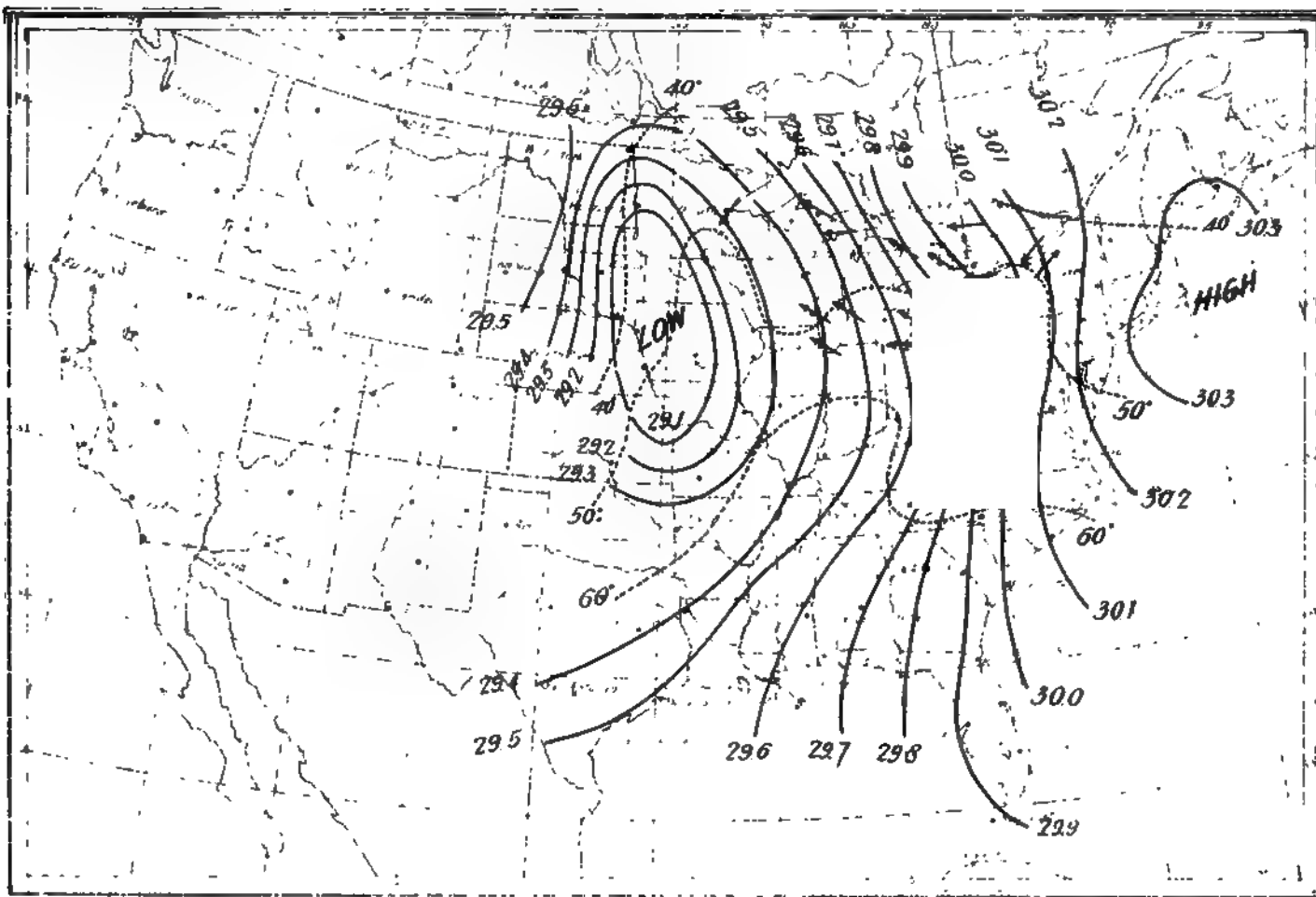
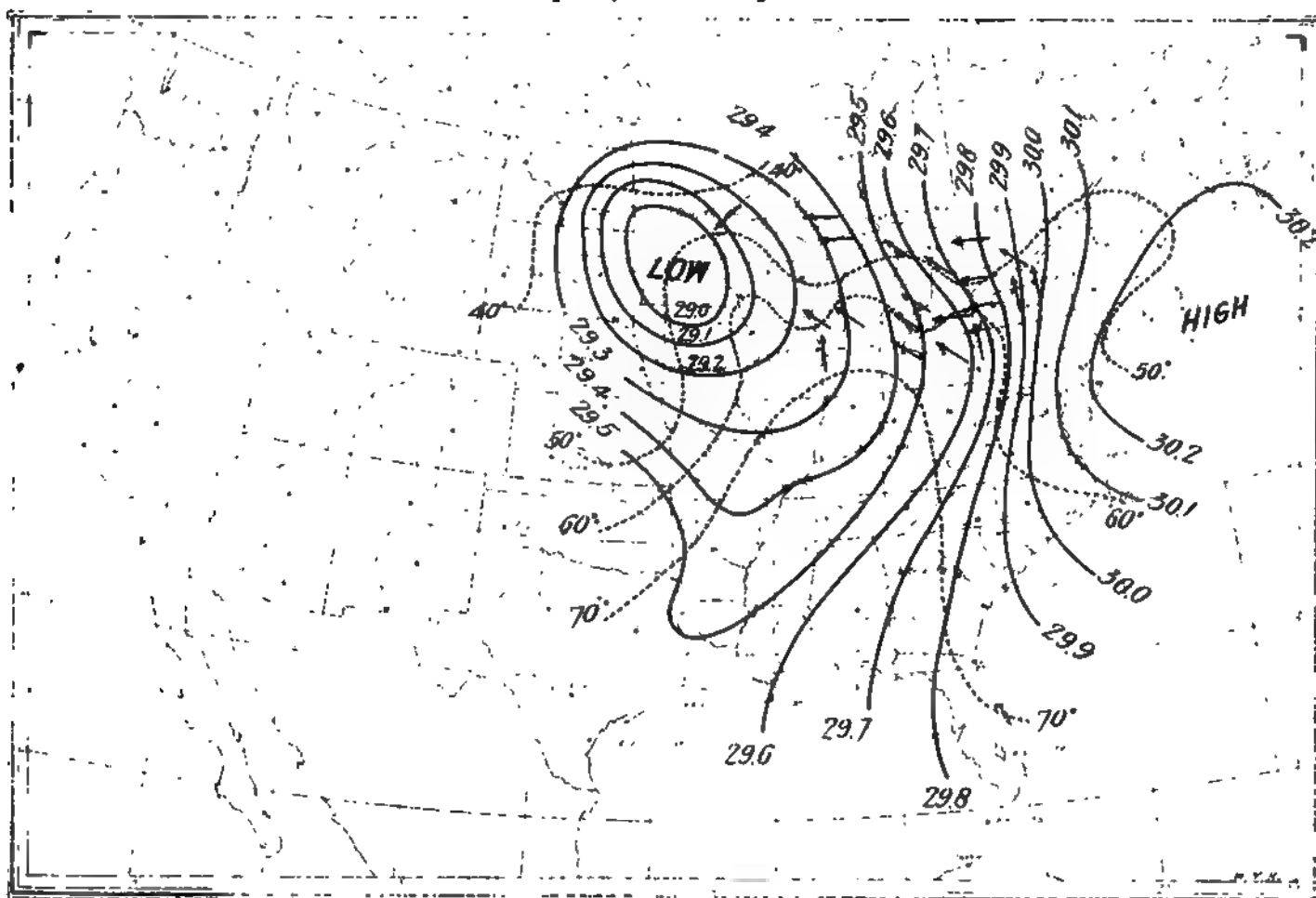


Chart CXXXX.

April 9, 1878—4:35 p. m.



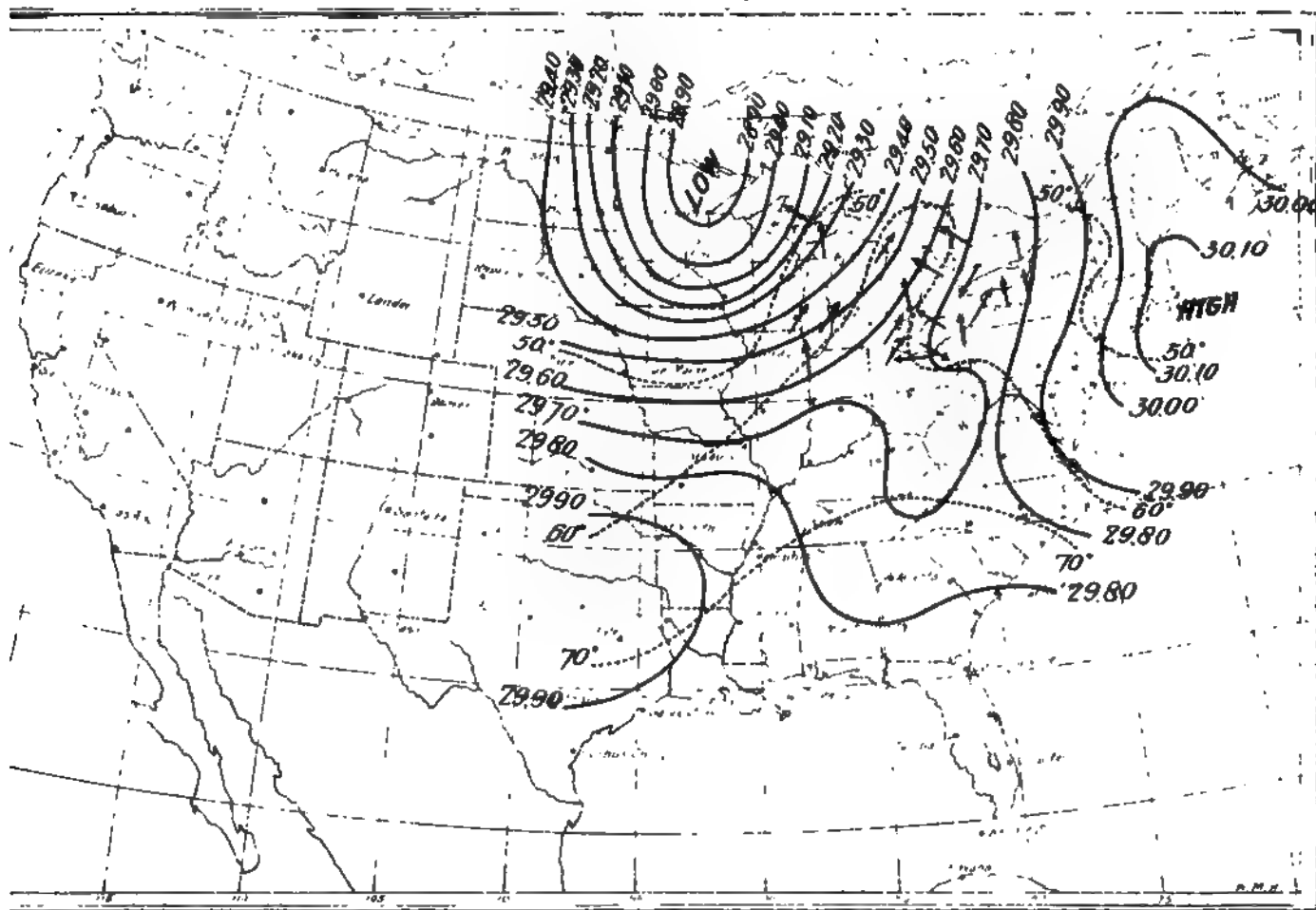
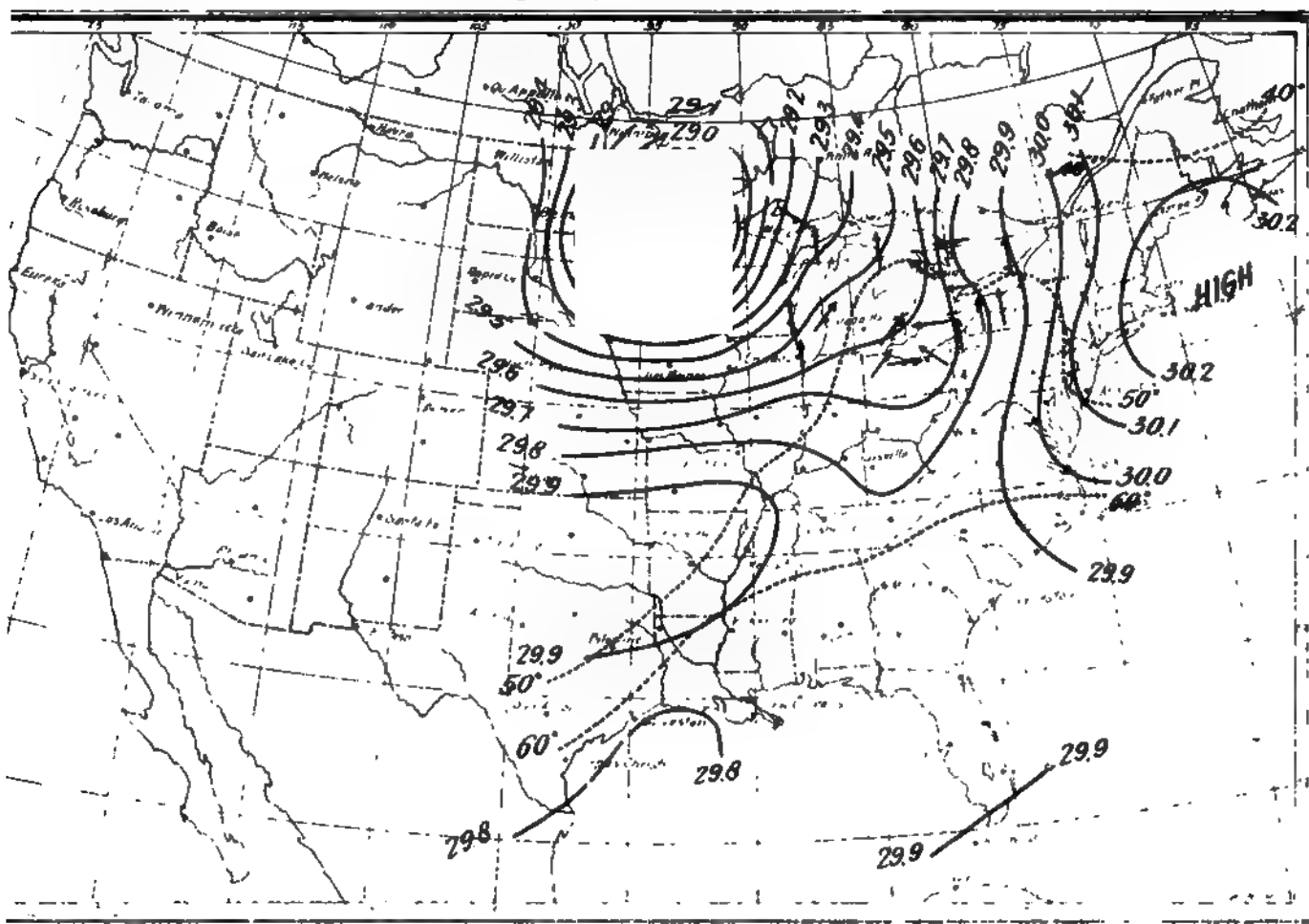


Chart OOOXXIII.

April 1, 1879—7:35 a. m.

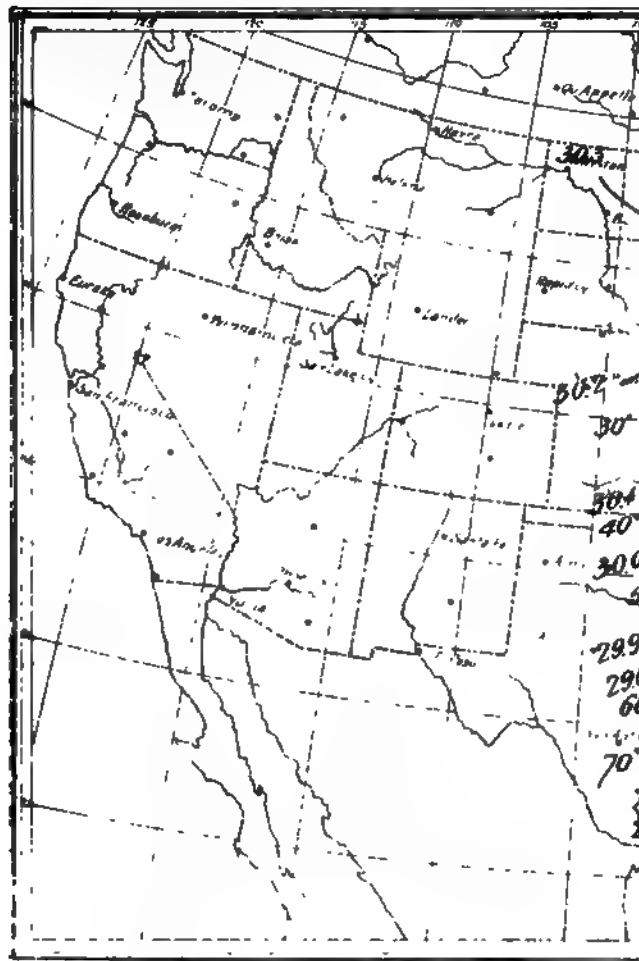


Chart OOOXXIV.

April 1, 1879—4:35 p. m.

Chart COXXXV.

April 2, 1879—7:35 a. m.

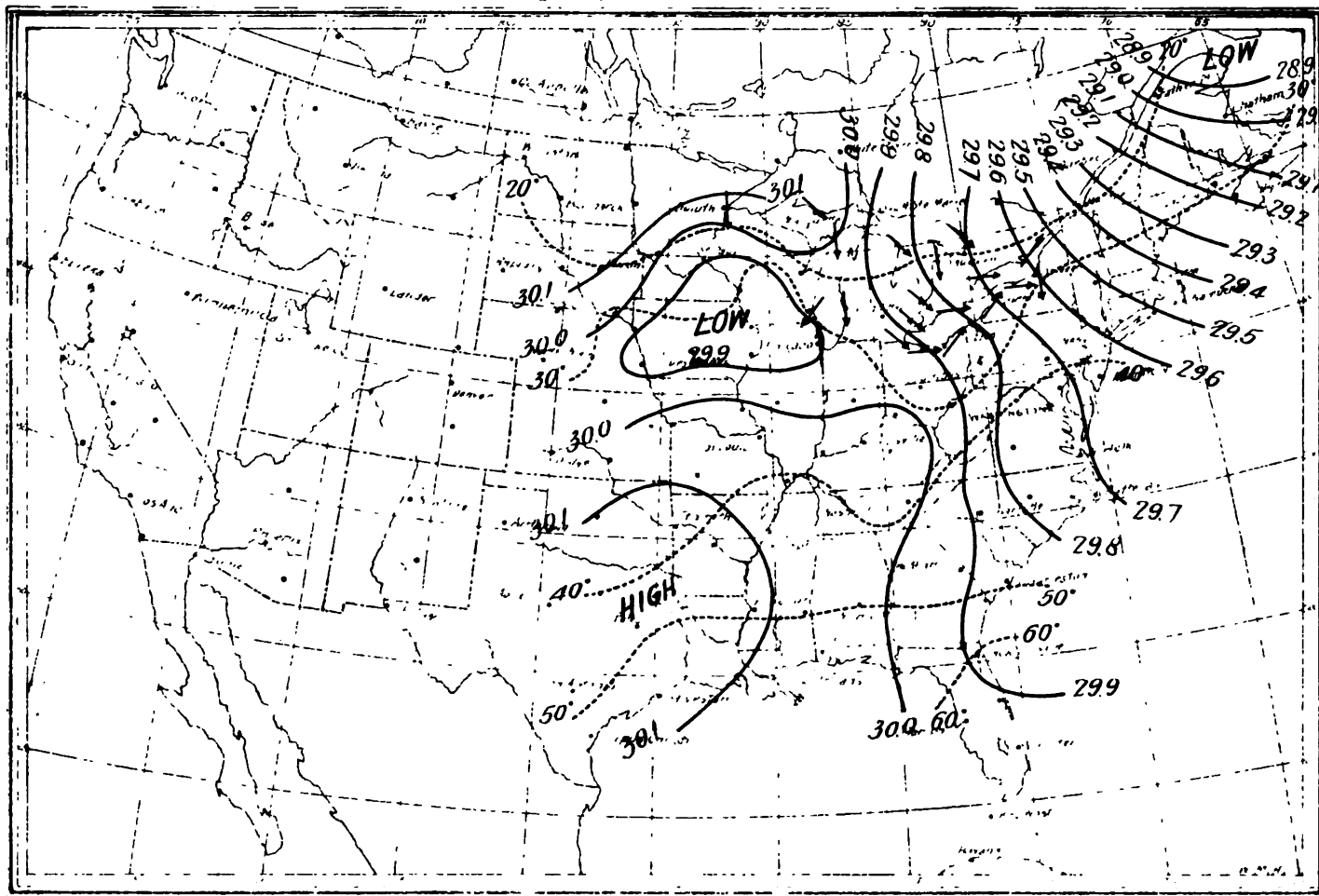


Chart COXXXVI.

April 2, 1879—4:35 p. m.

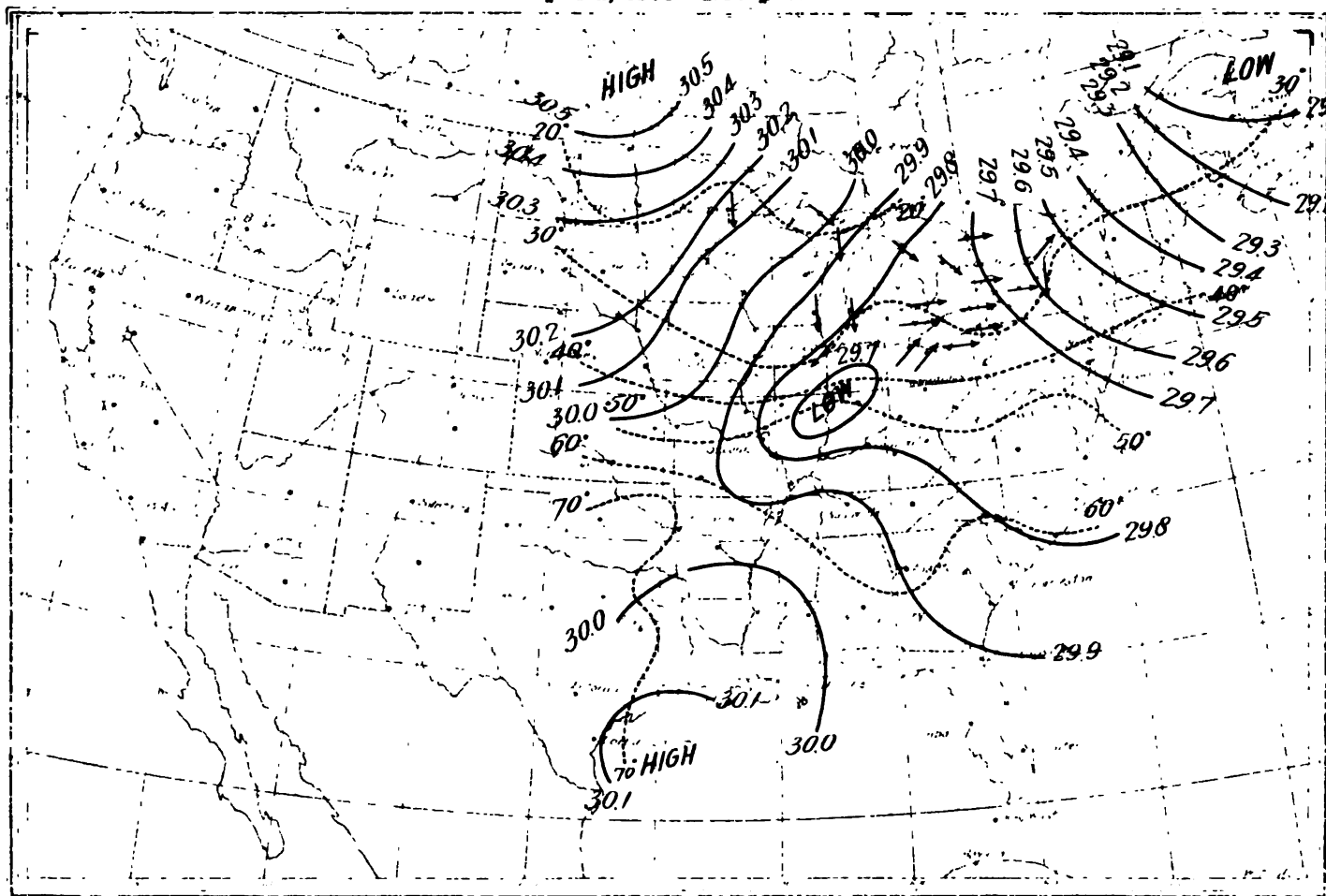


Chart OOOXXVII.

April 9, 1879—7:35 a. m.

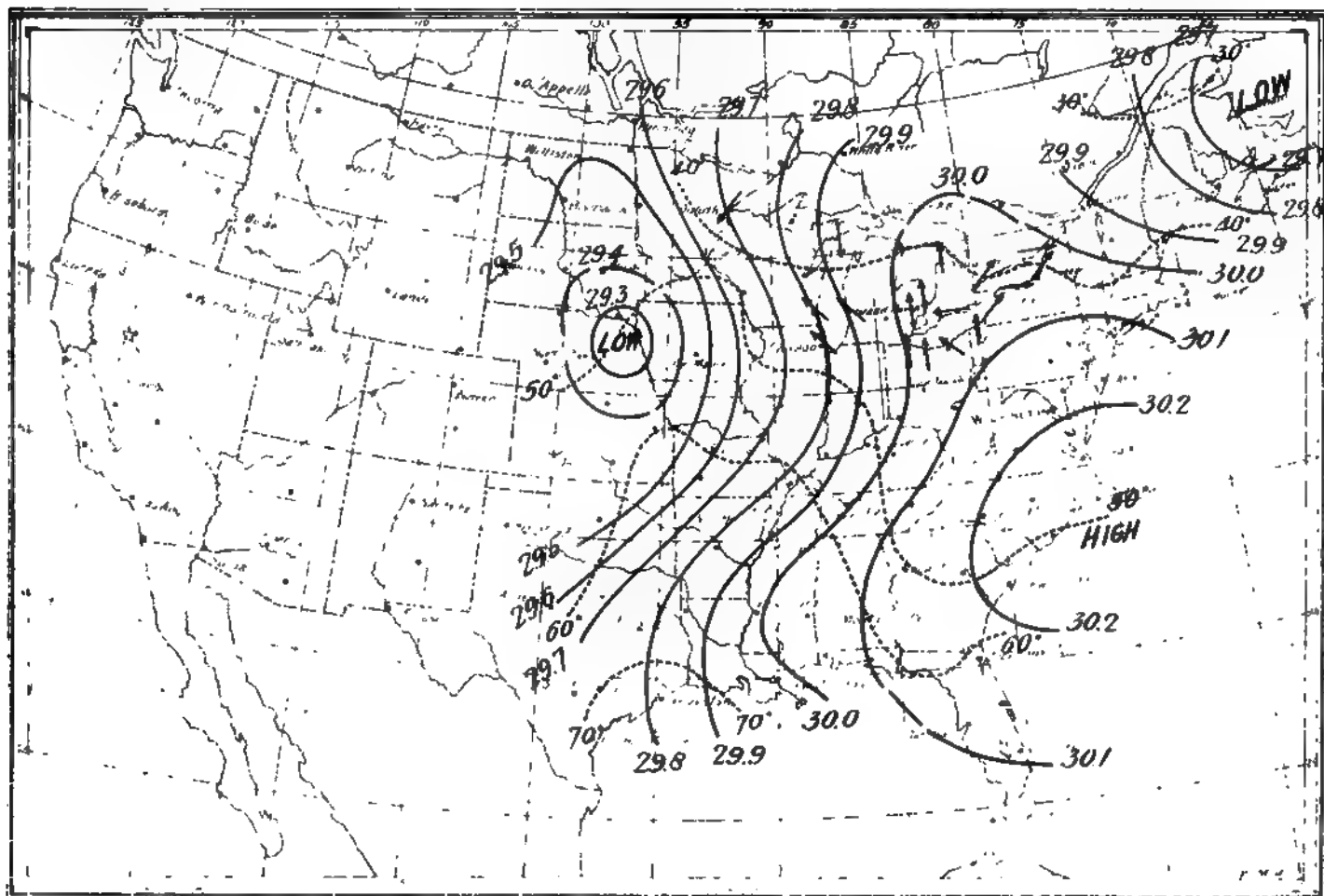


Chart OOOXXVIII.

April 9, 1879—4:35 p. m.

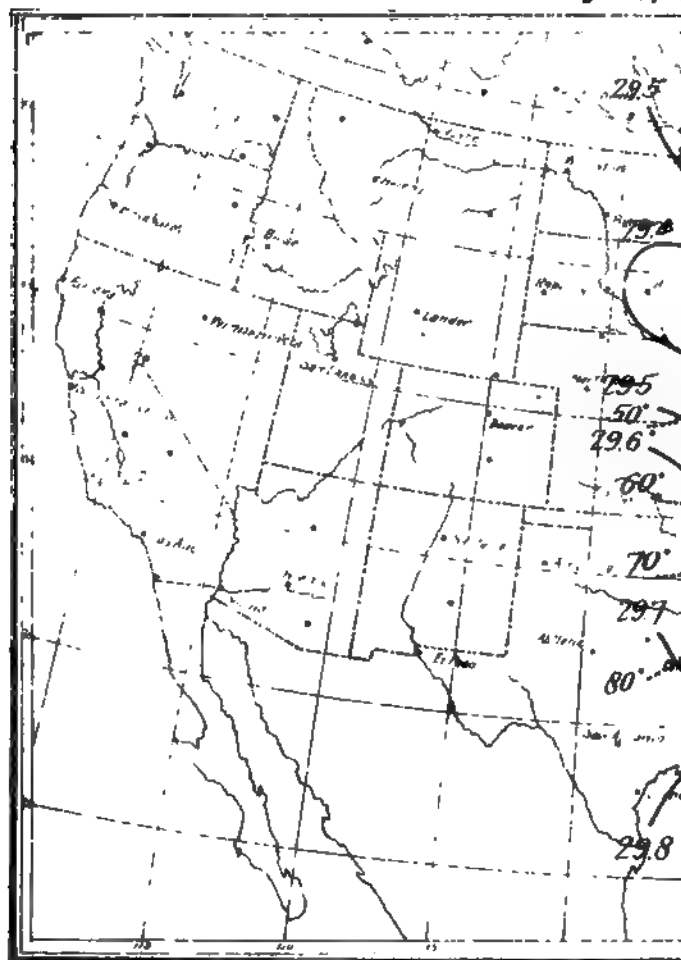


Chart CXXXIX.

April 10, 1879—7:35 a. m.

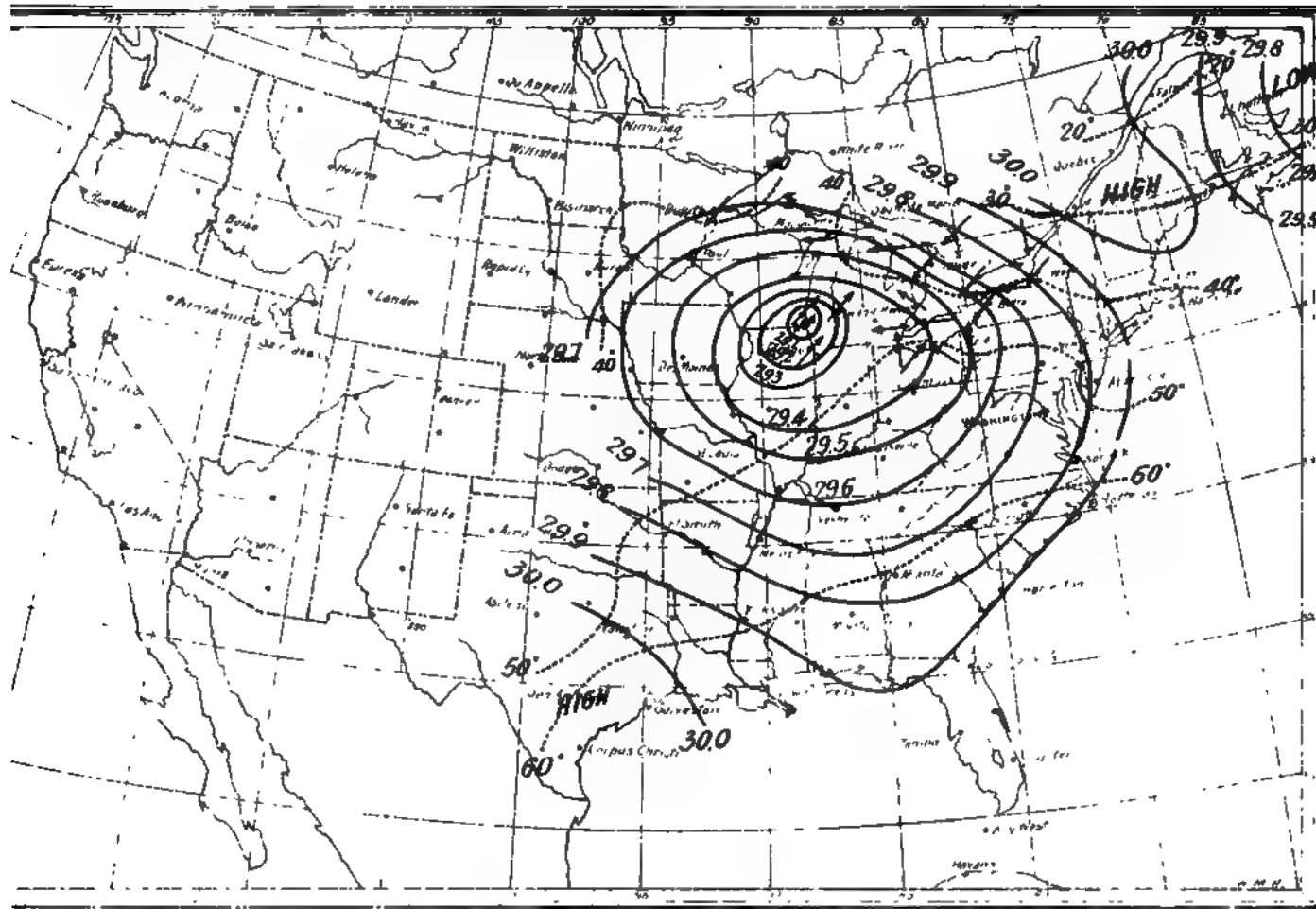


Chart CXXI.

April 10, 1879—4:35 p. m.

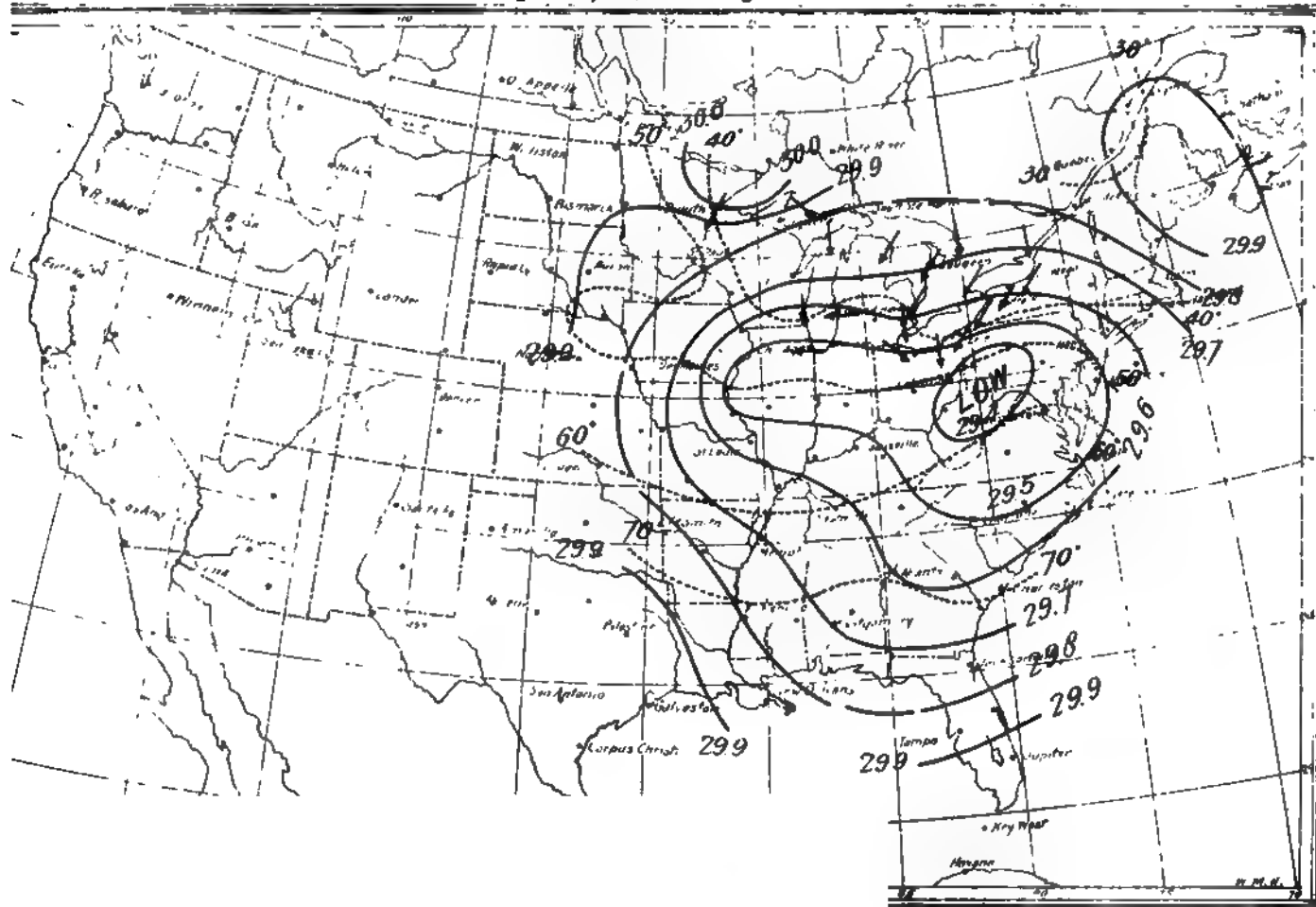


Chart COXLII

April 18, 1880—7 a. m.

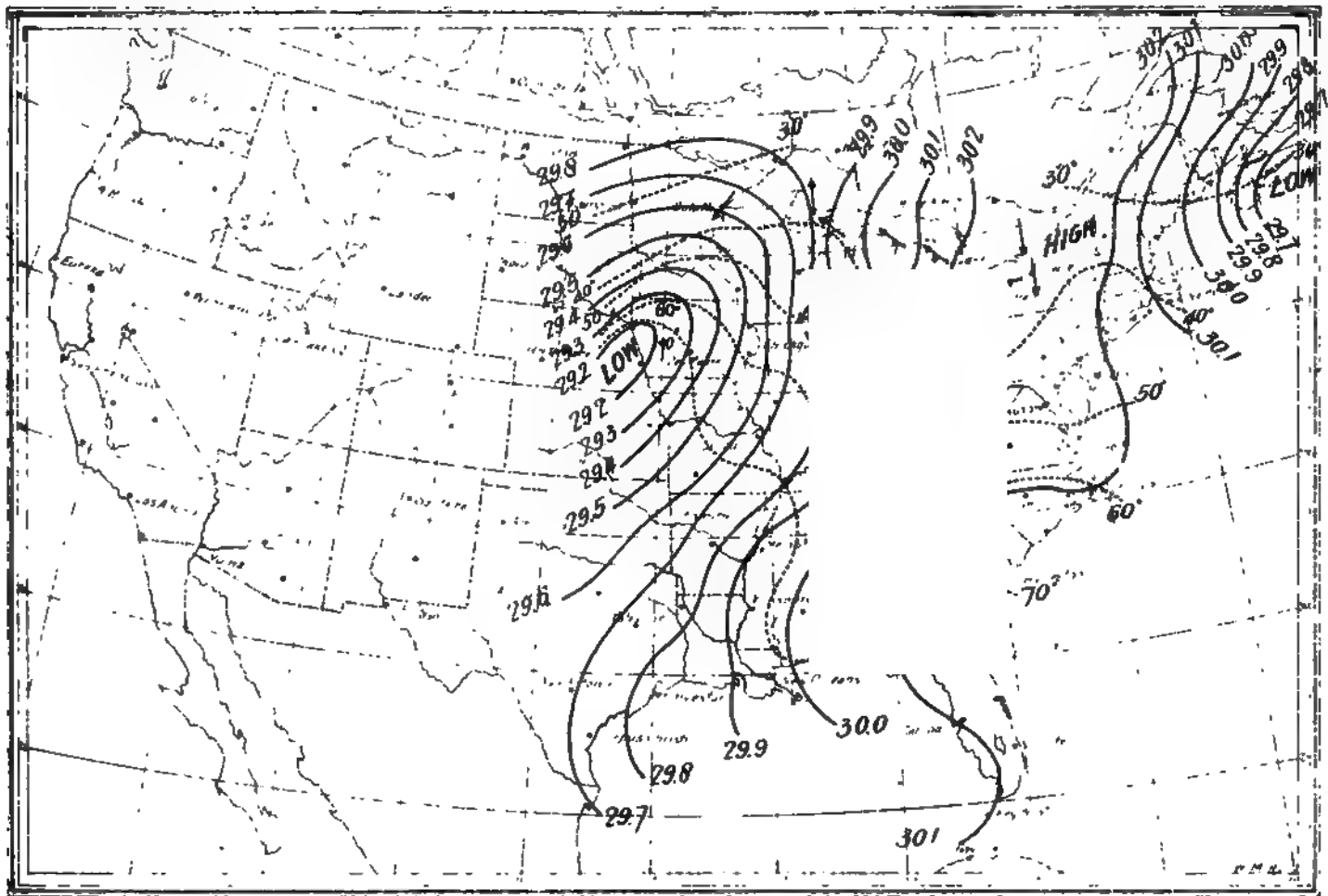
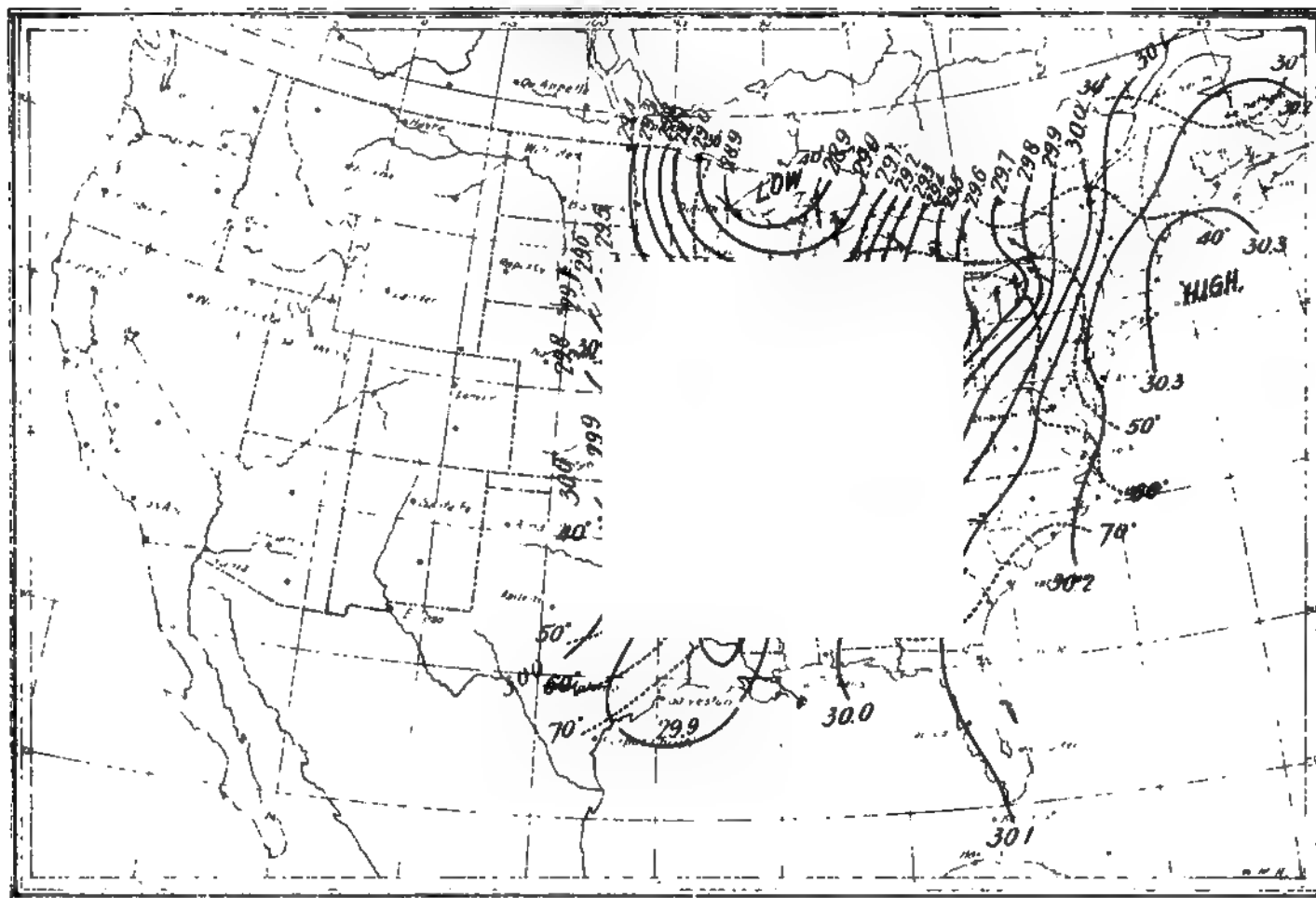


Chart COXLII

April 18, 1880—3 p. m.



April 19, 1880—7 a. m.



April 19, 1880—3 p. m.

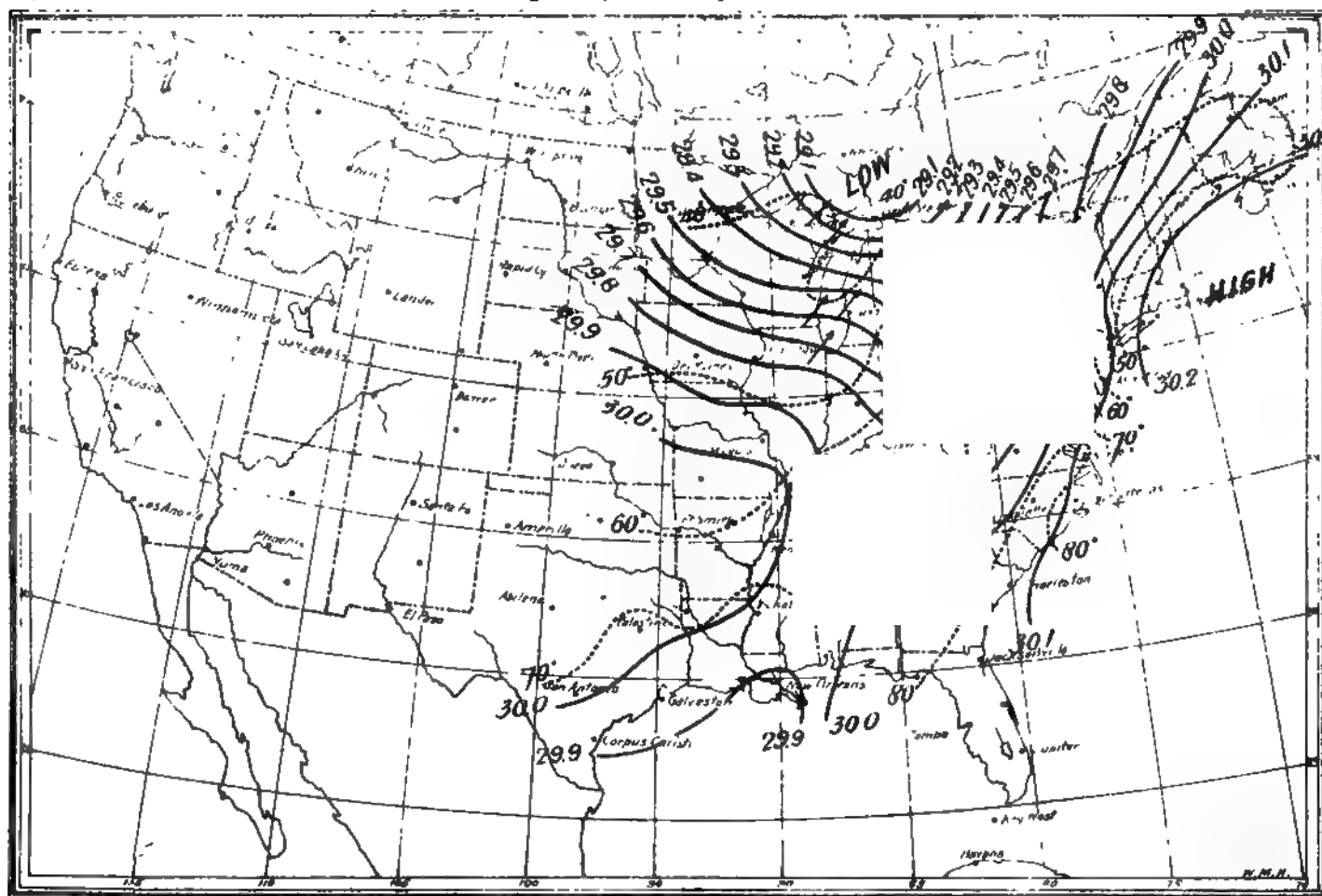


Chart COXLV.

April 9, 1883—7 a. m.

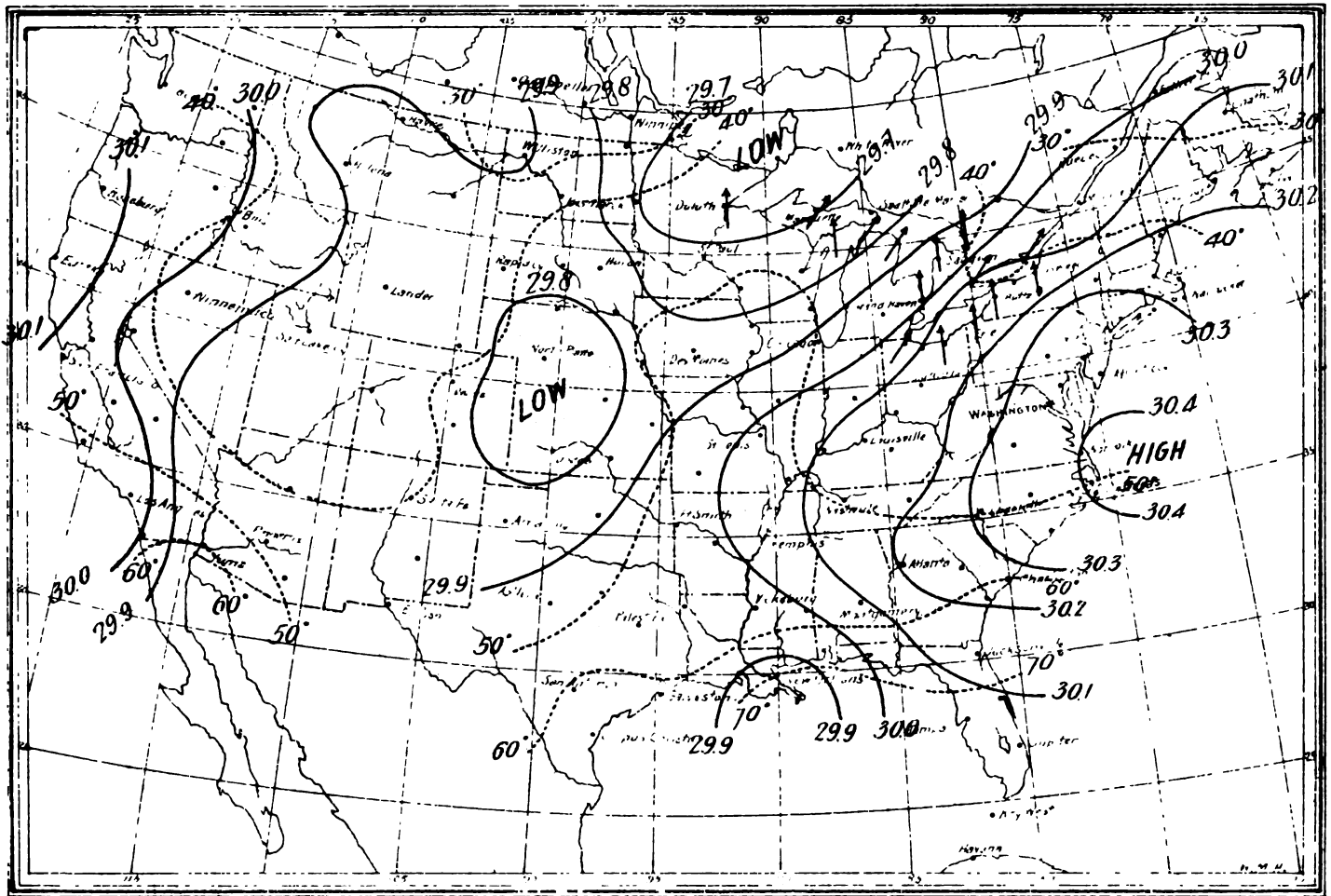


Chart COXLVI.

April 9, 1883—3 p. m.

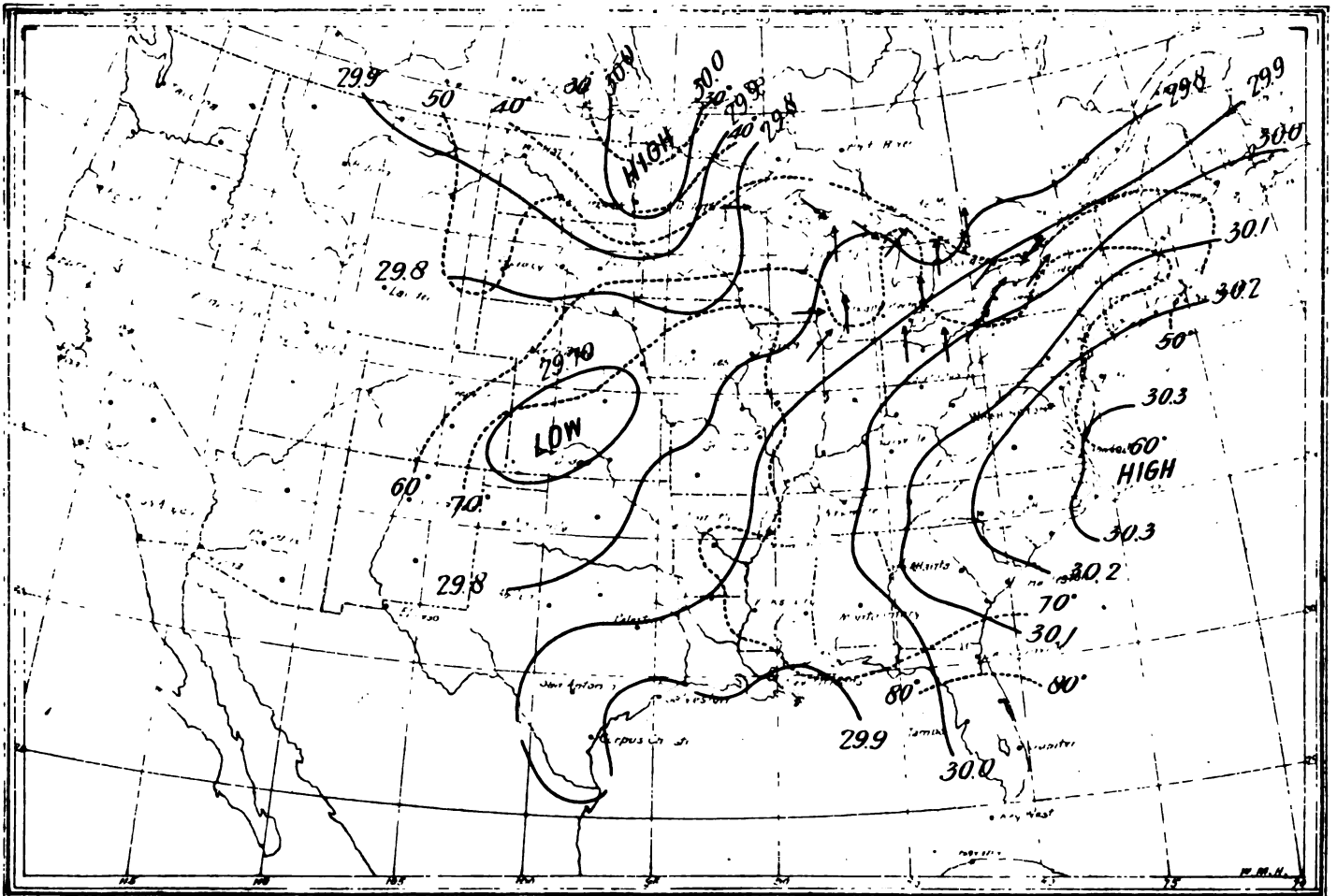


Chart COXLVII

April 10, 1888—7 a. m.

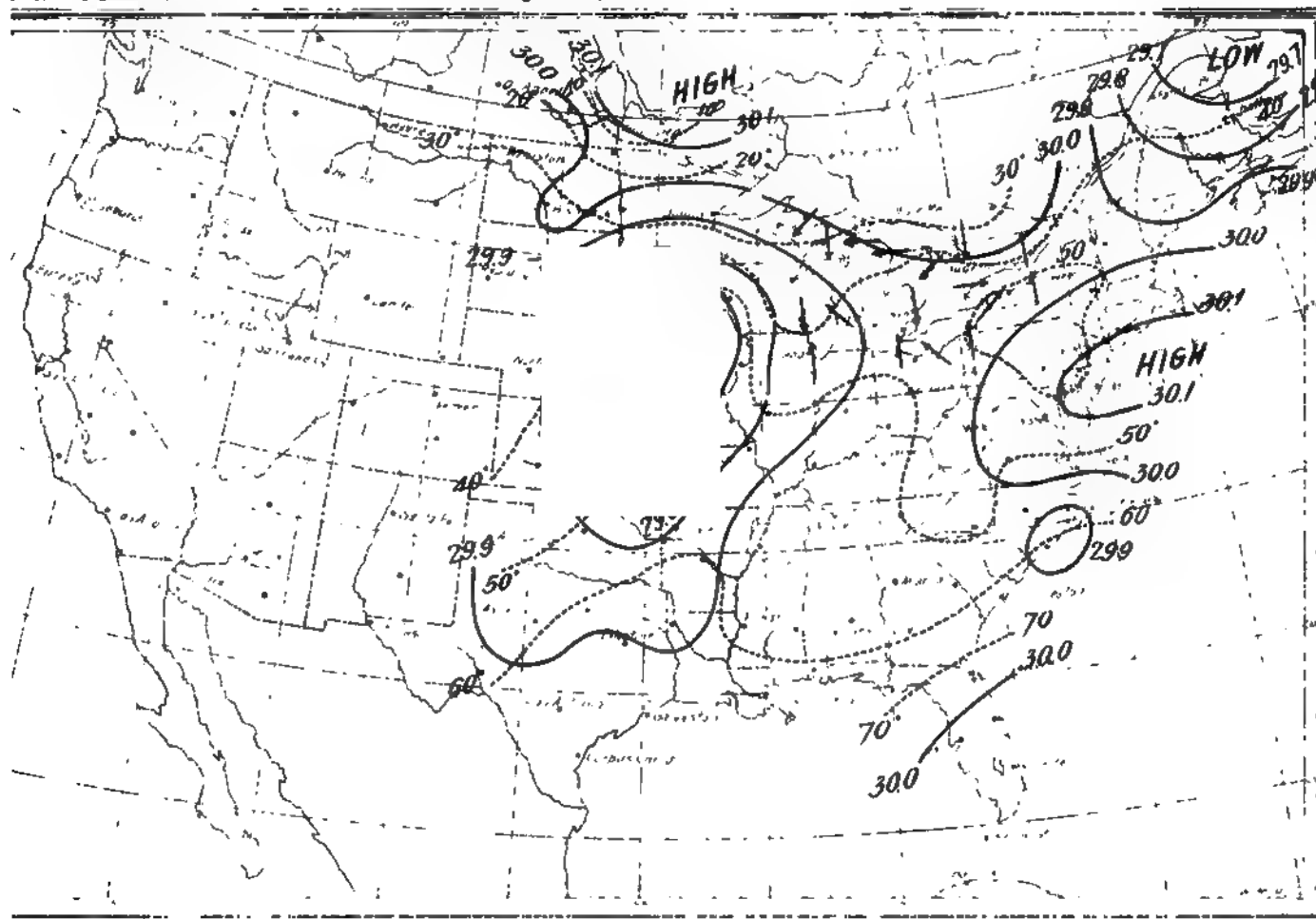


Chart COXLVIII

April 10, 1888—3 p. m.

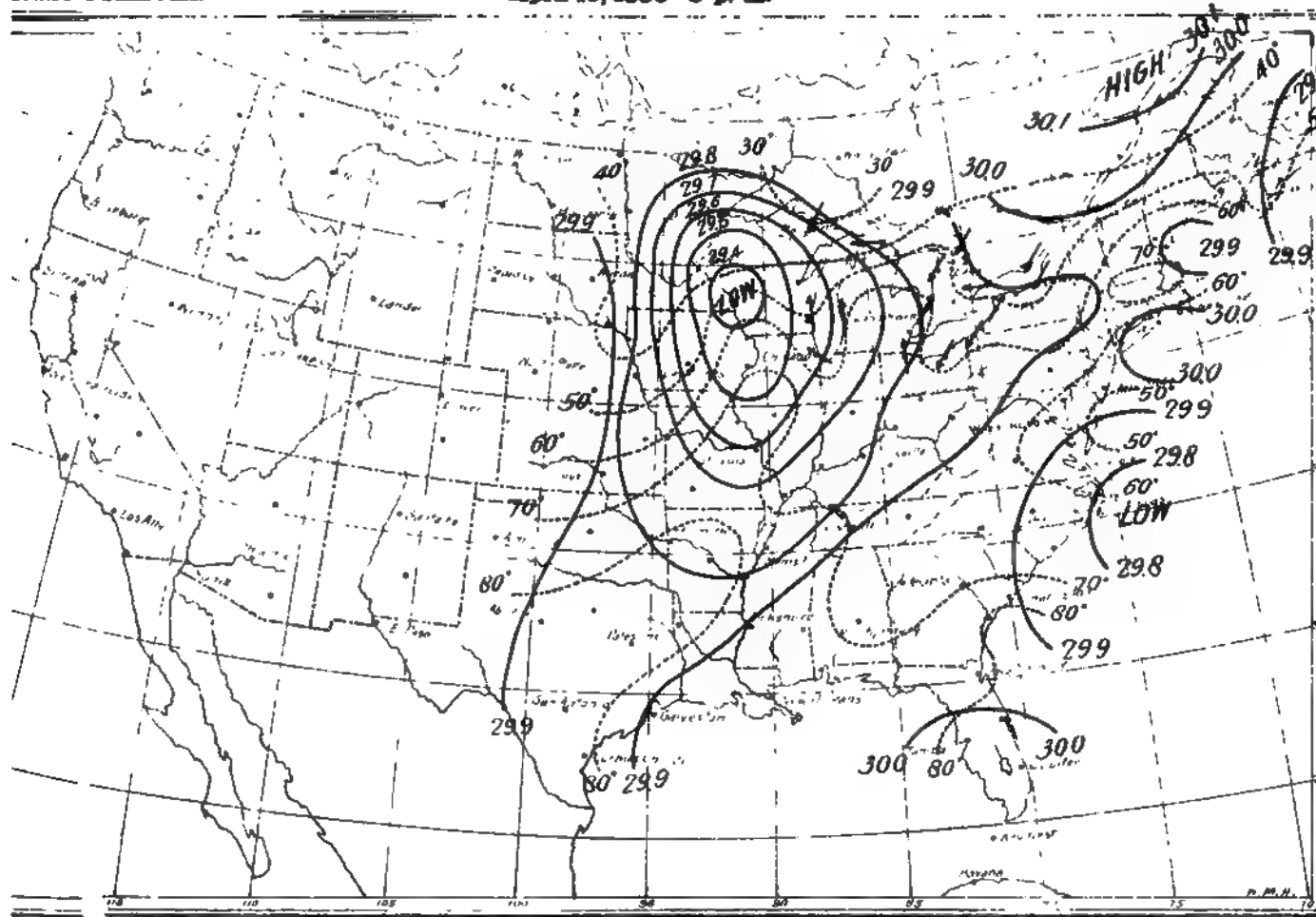


Chart COXLIX.

April 14, 1884—7 a. m.

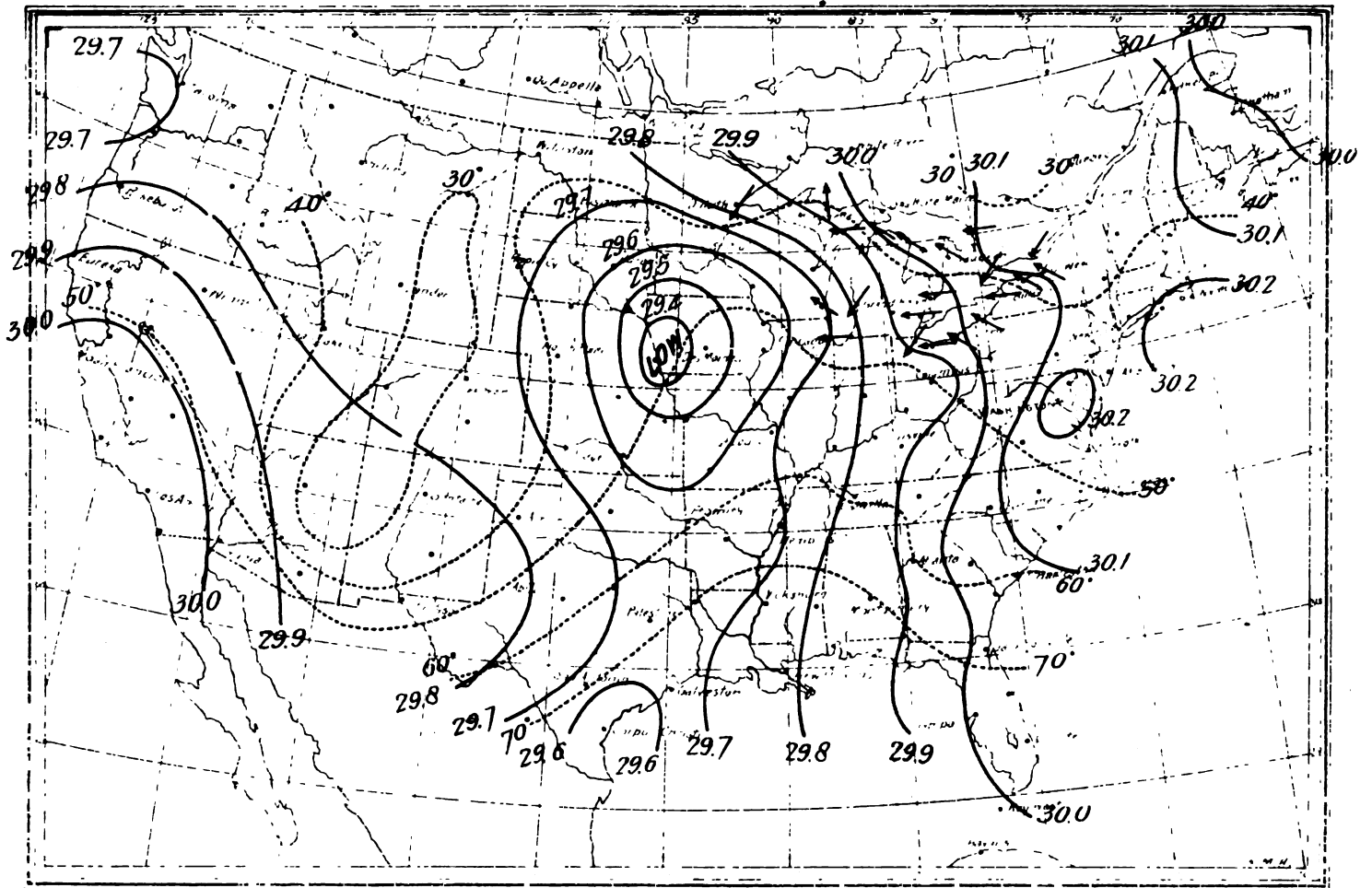


Chart COCL.

April 14, 1884—8 p. m.

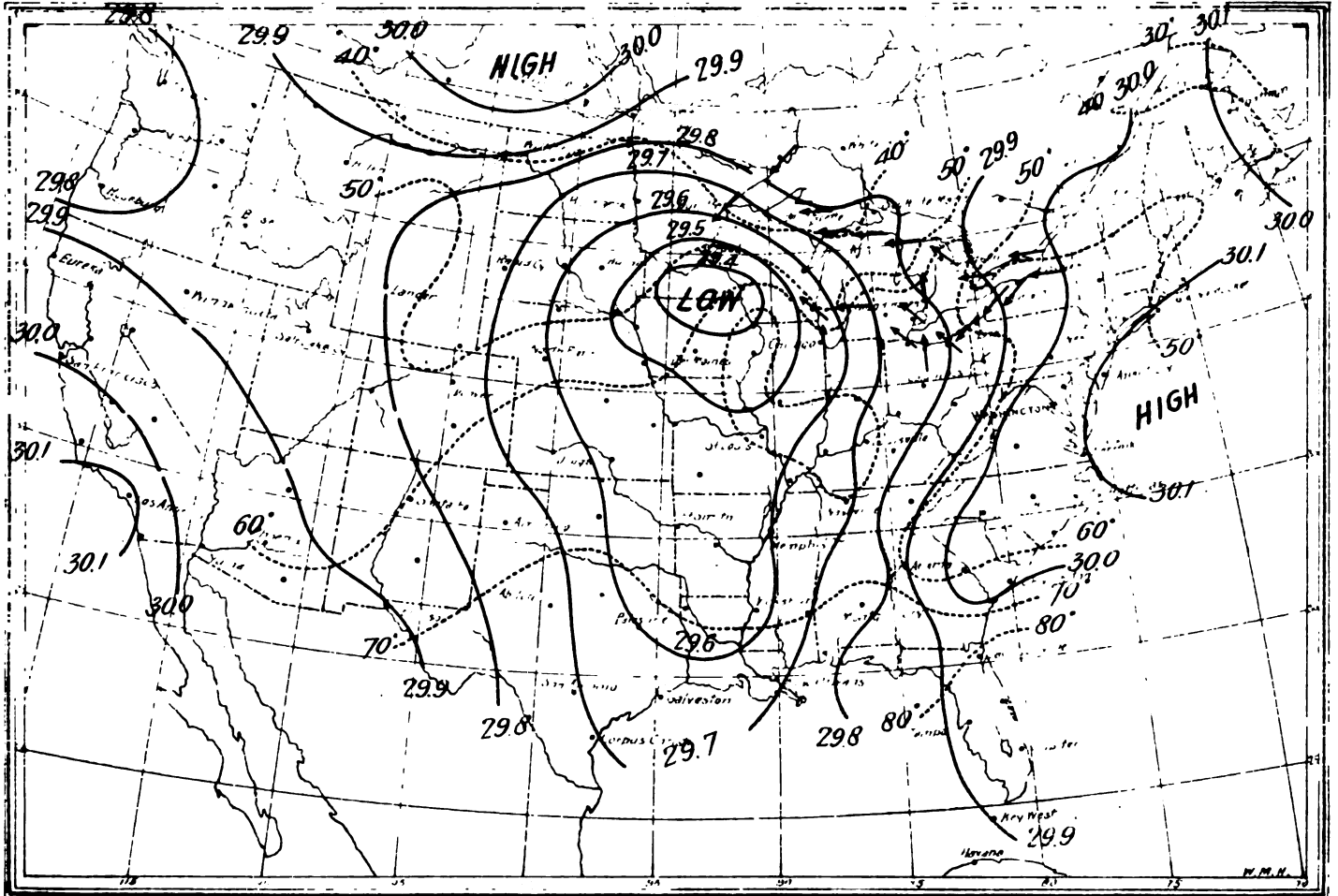


Chart CCLL

April 15, 1884-7 a. m.

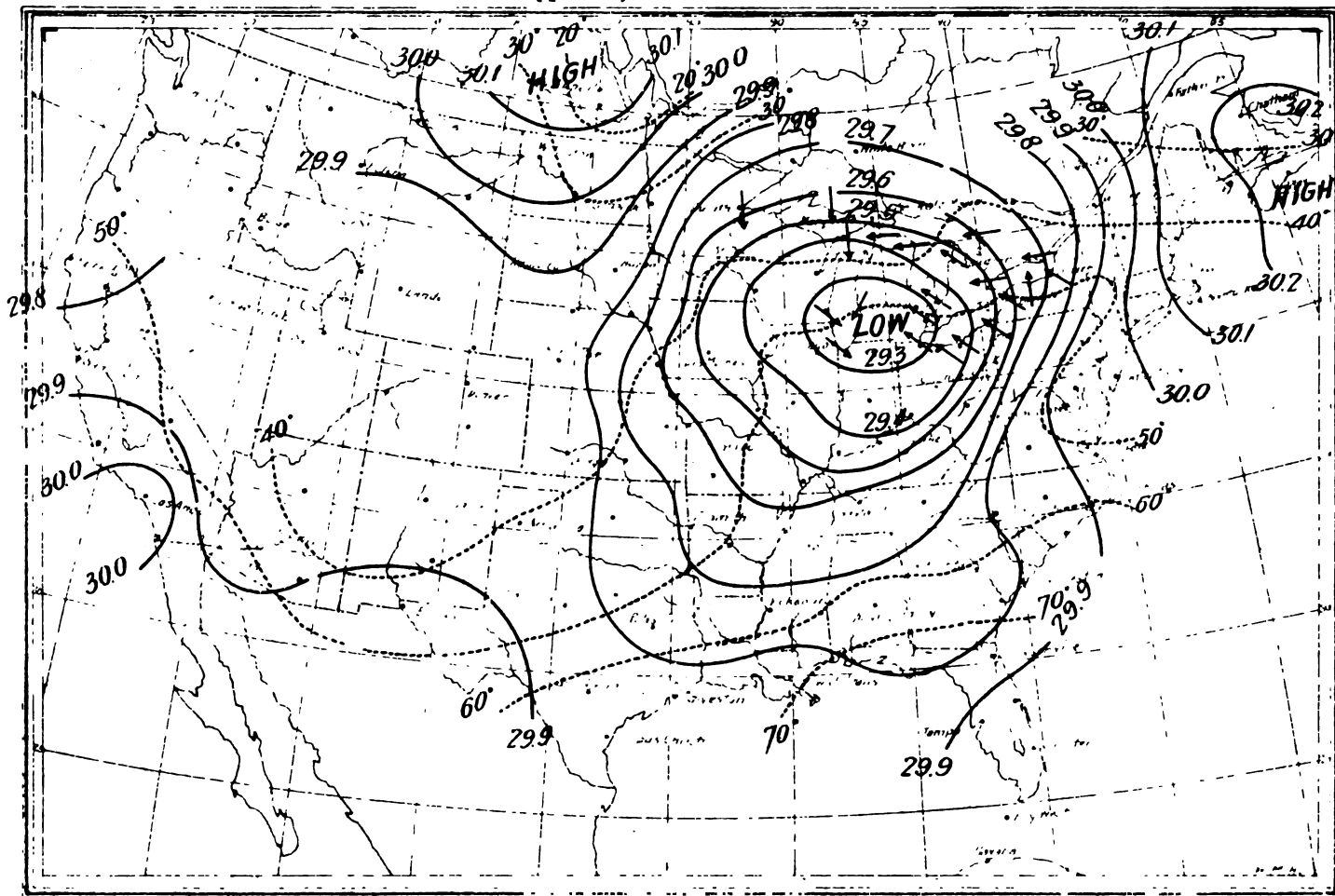


Chart CCLL

April 15, 1884-3 p. m.

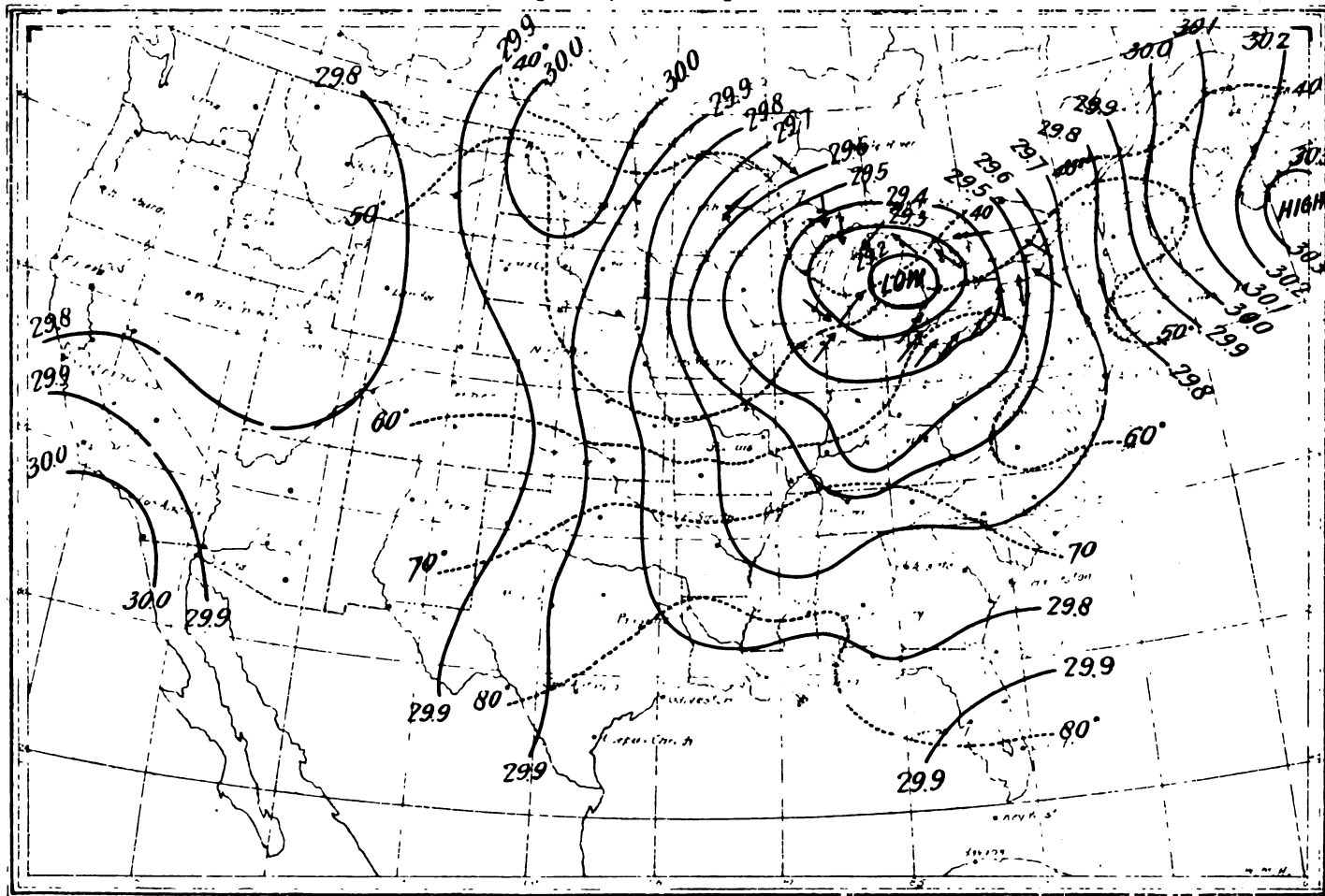


Chart OCLIII.

April 27, 1894—7 a. m.

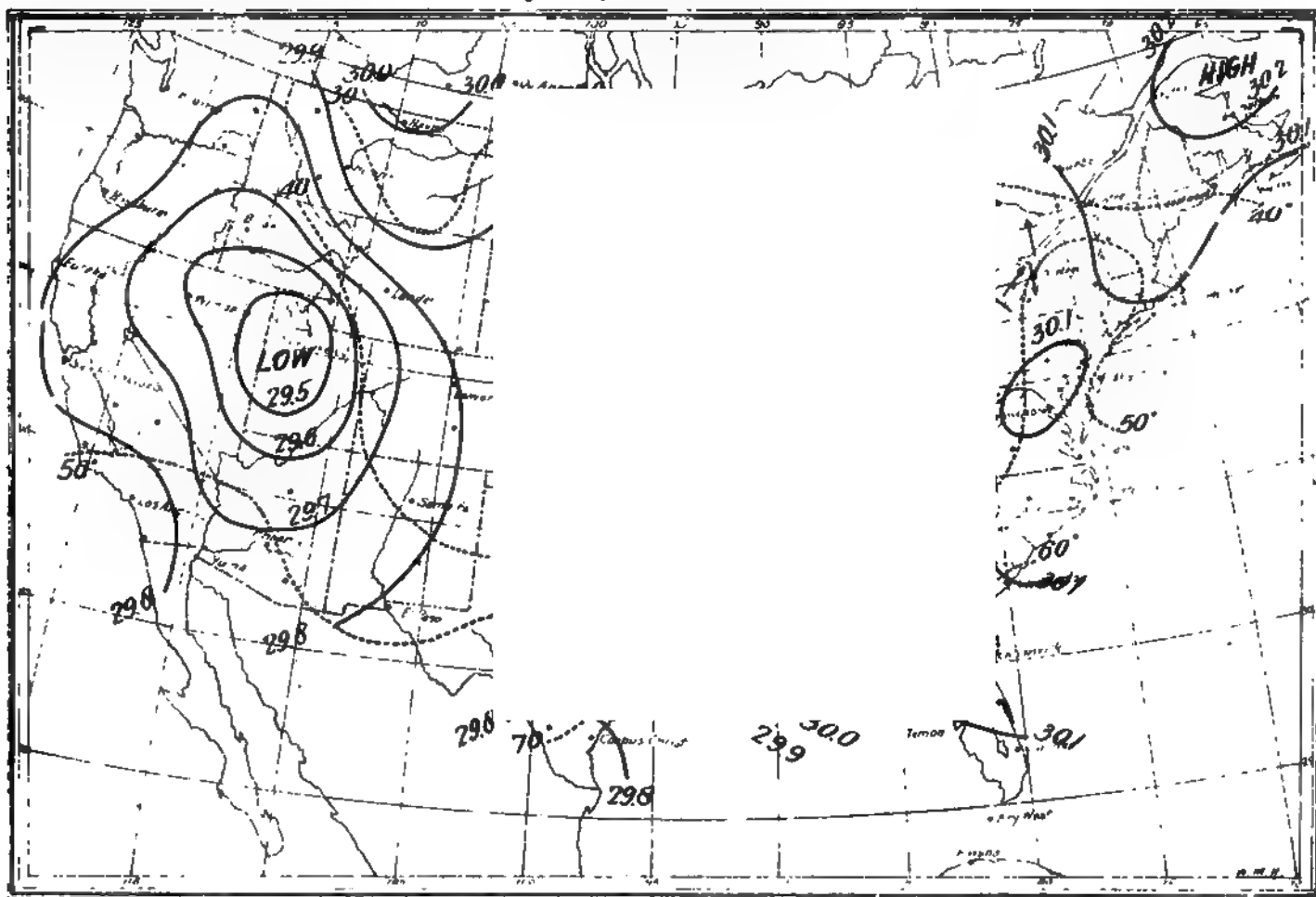


Chart OCLIV.

April 27, 1894—8 p. m.

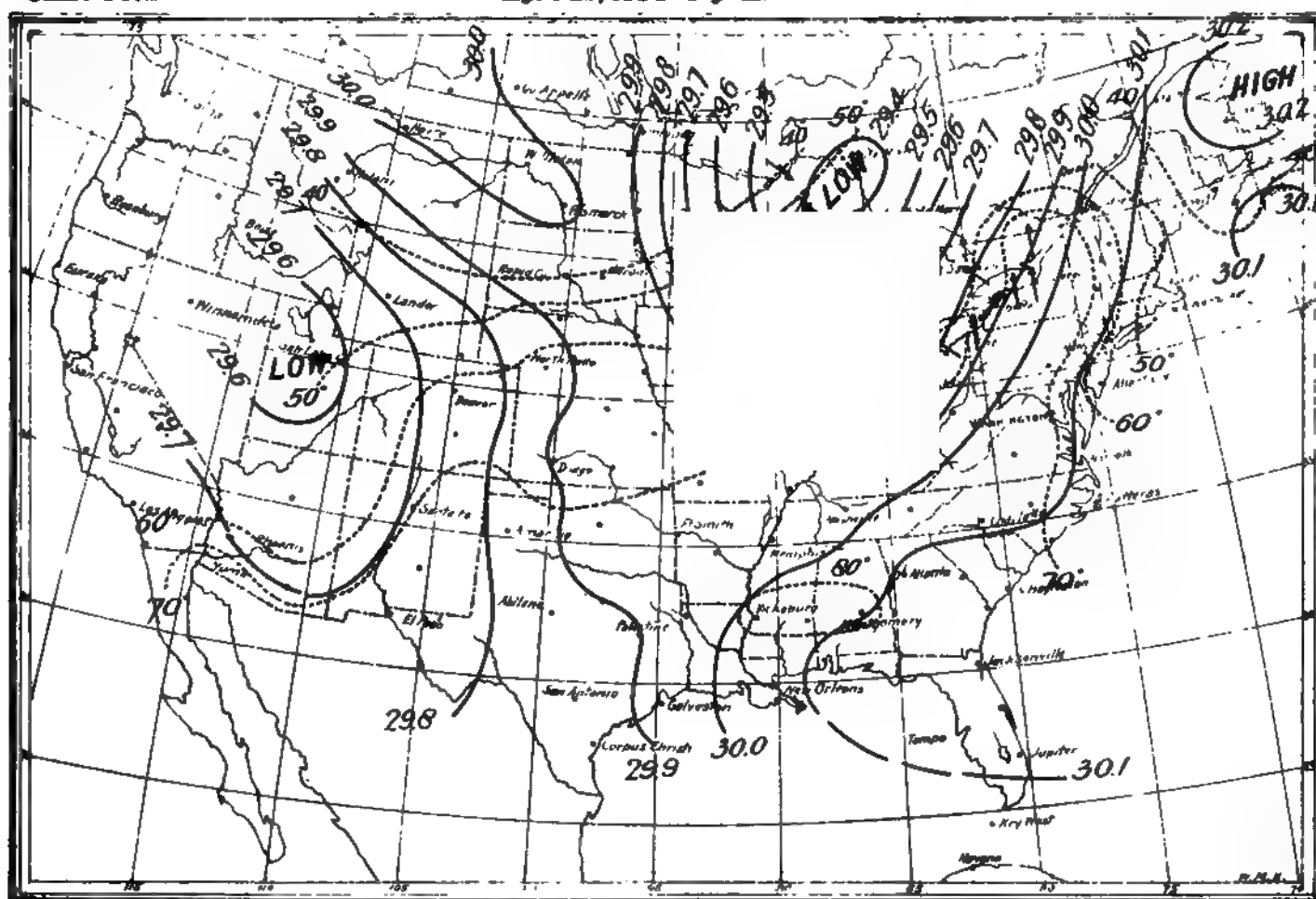


Chart COLV.

April 28, 1884—7 a. m.

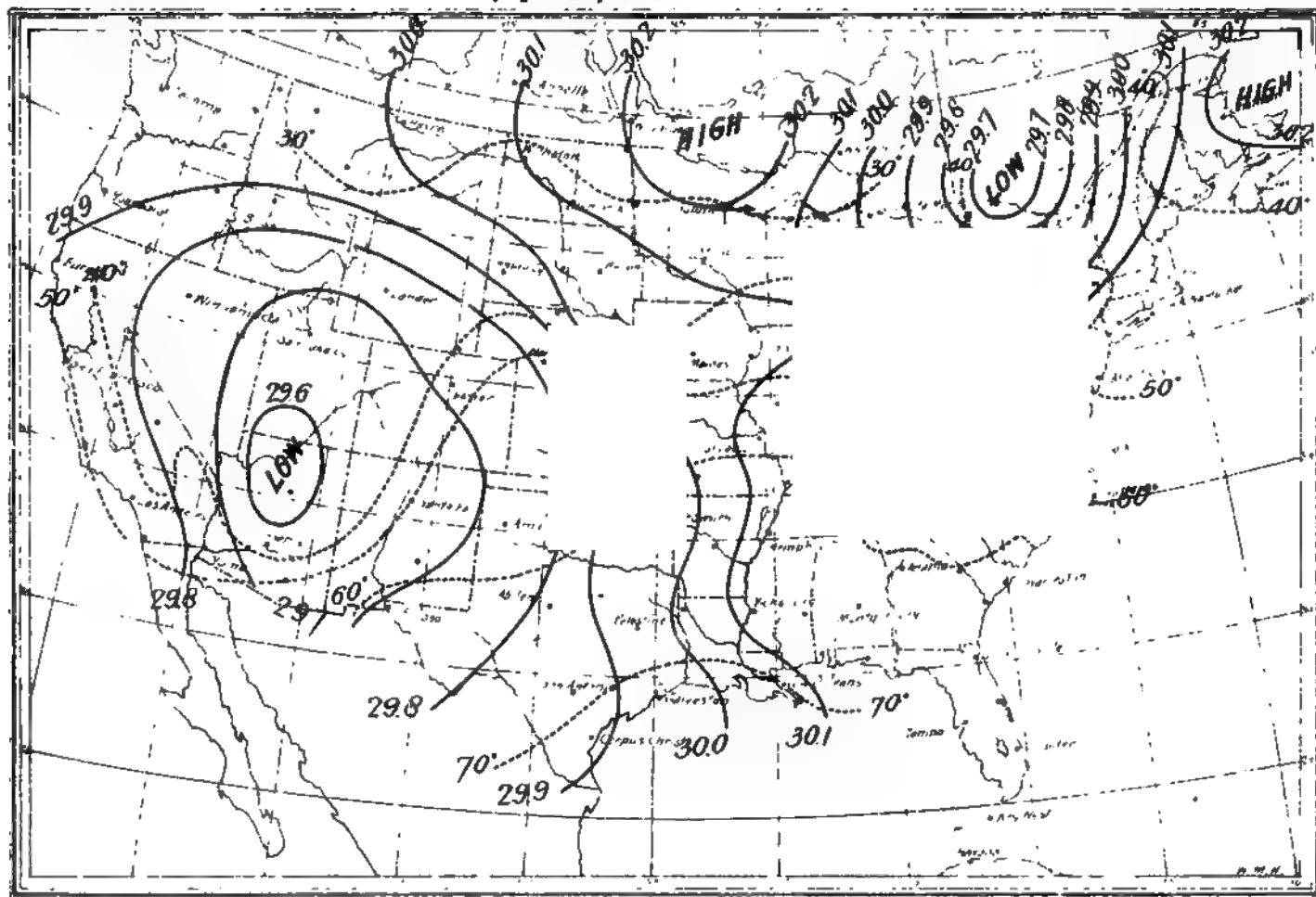


Chart COLVI.

April 28, 1884—8 p. m.

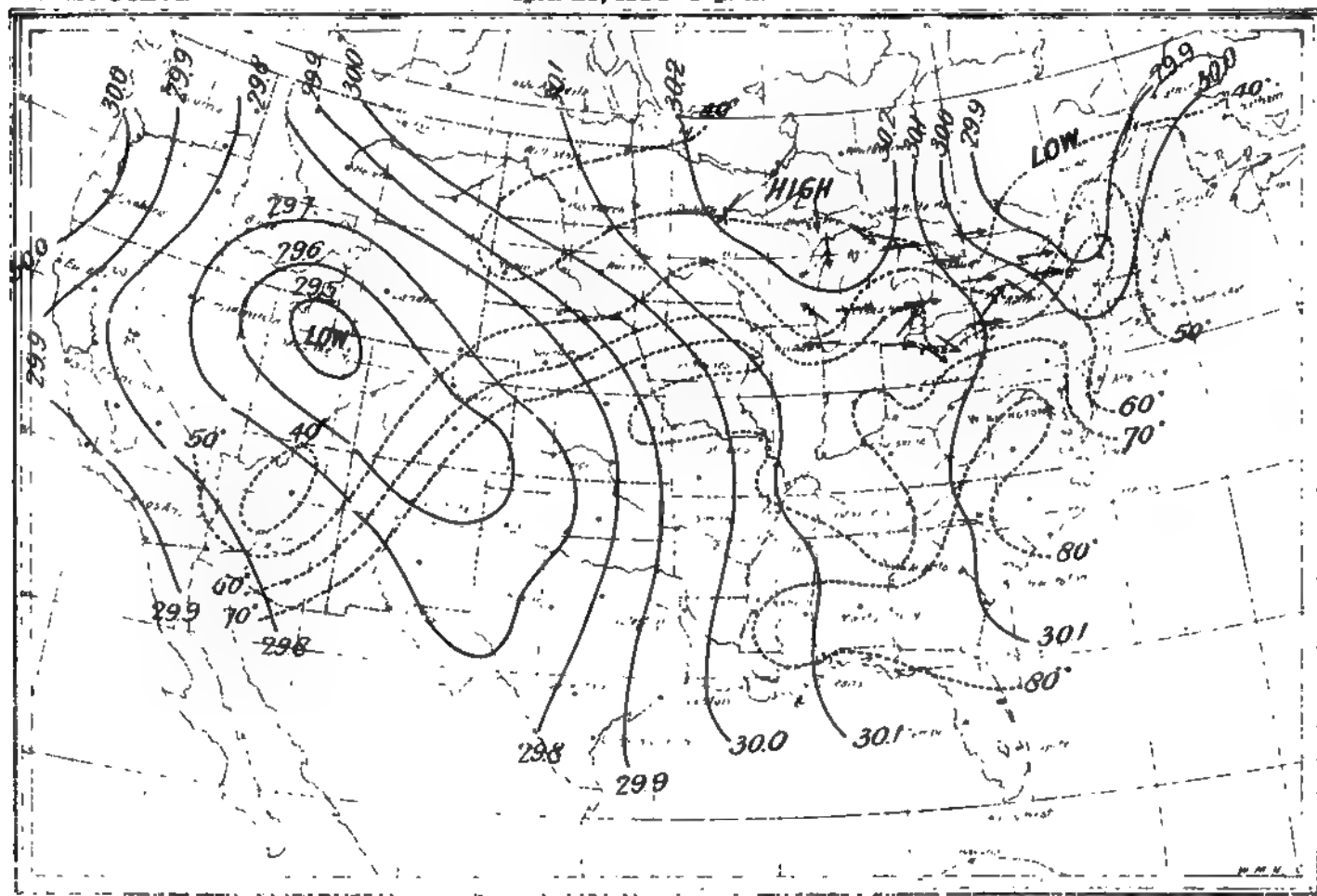


Chart OOLVII.

April 6, 1896—7 a. m.

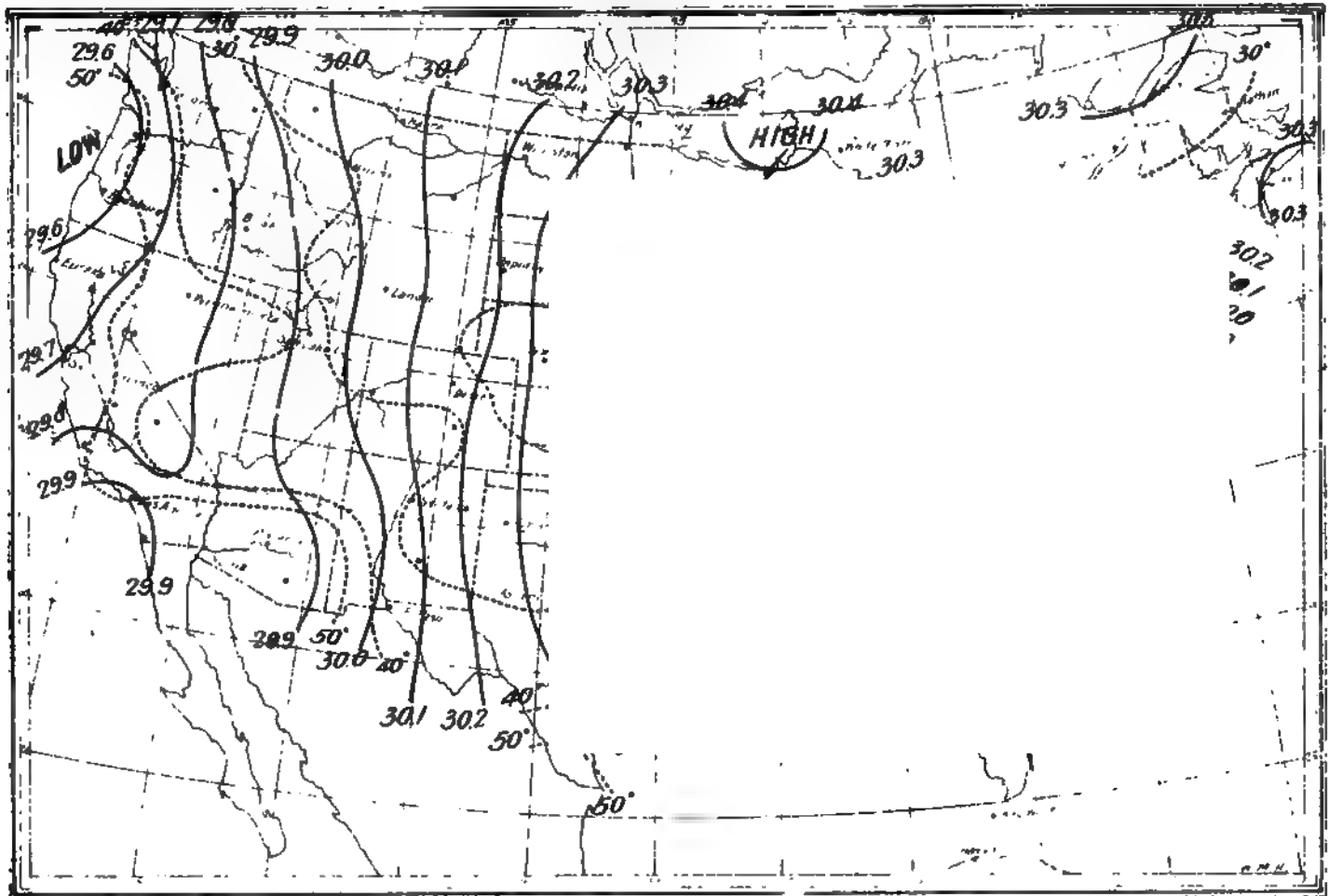
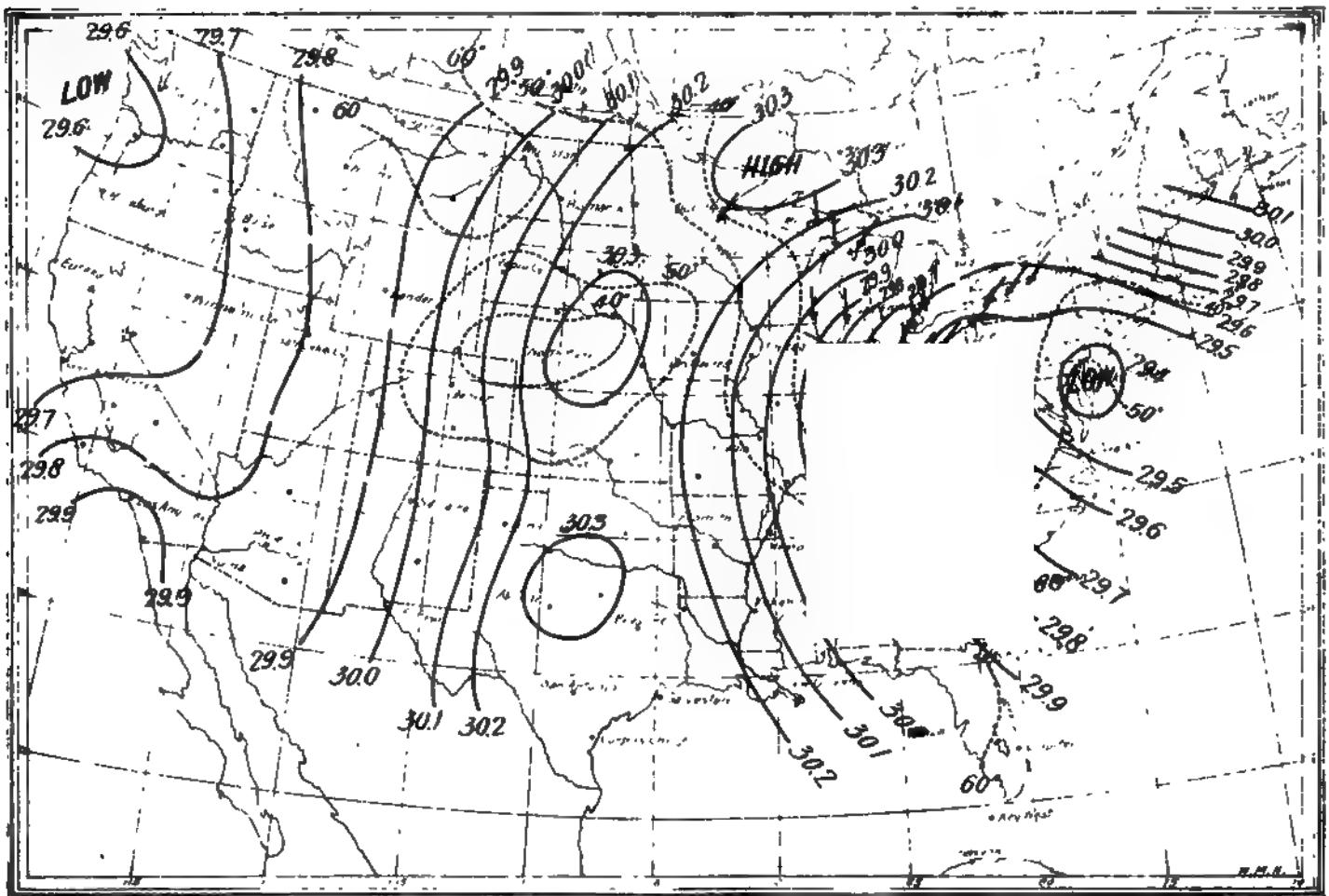


Chart OOLVIII.

April 6, 1896—3 p. m.



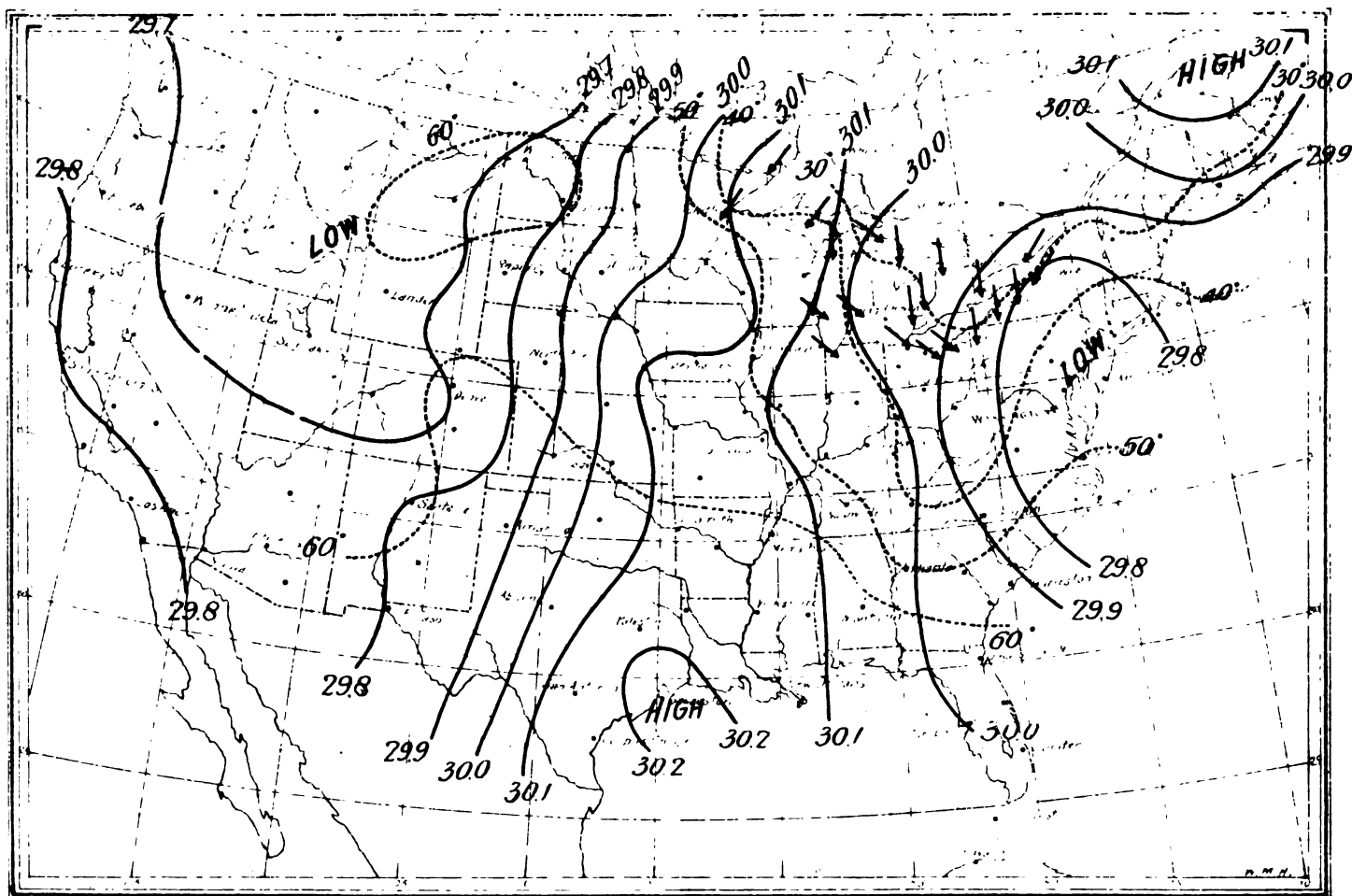
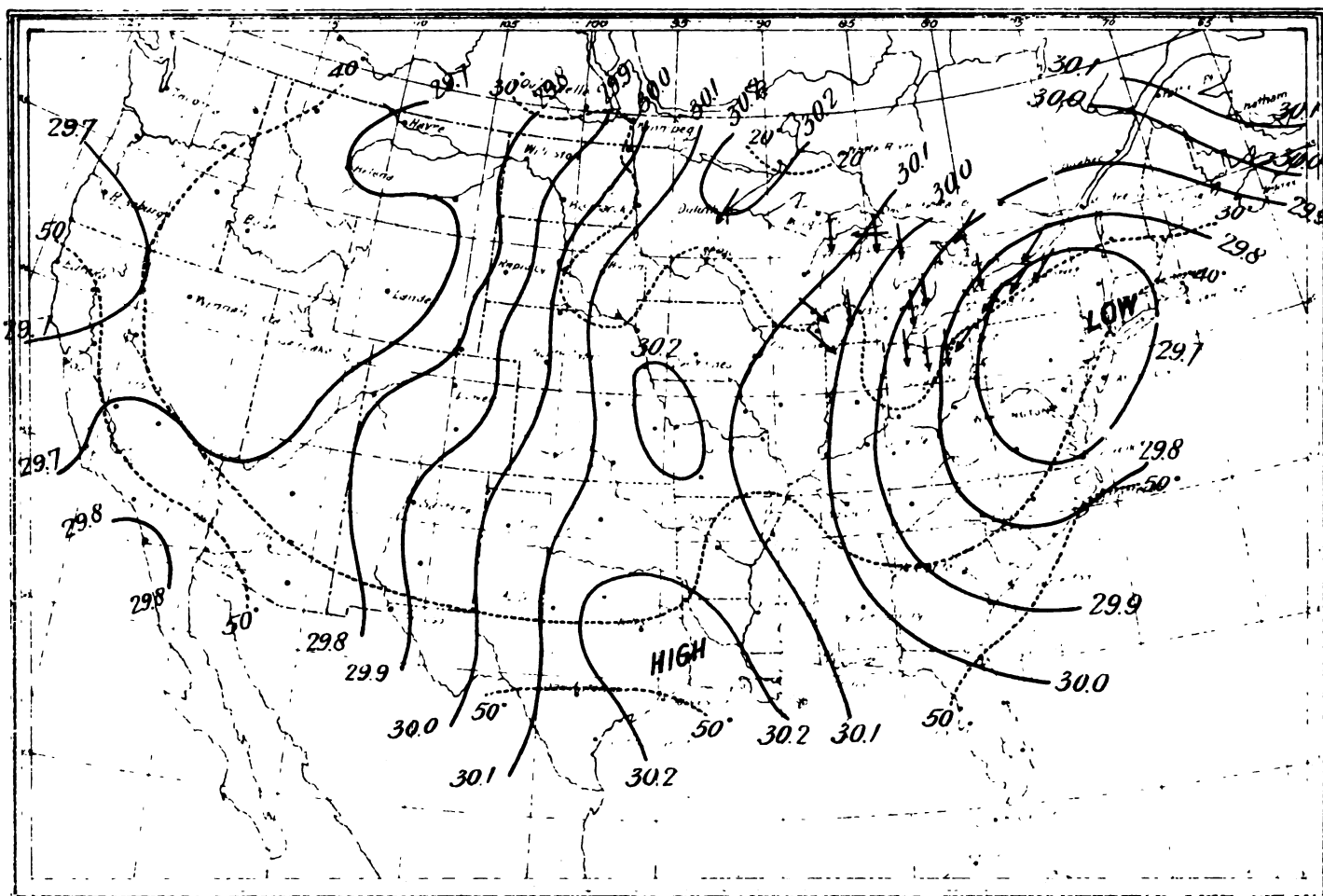


Chart OOLXI.

April 3, 1887—7 a. m.

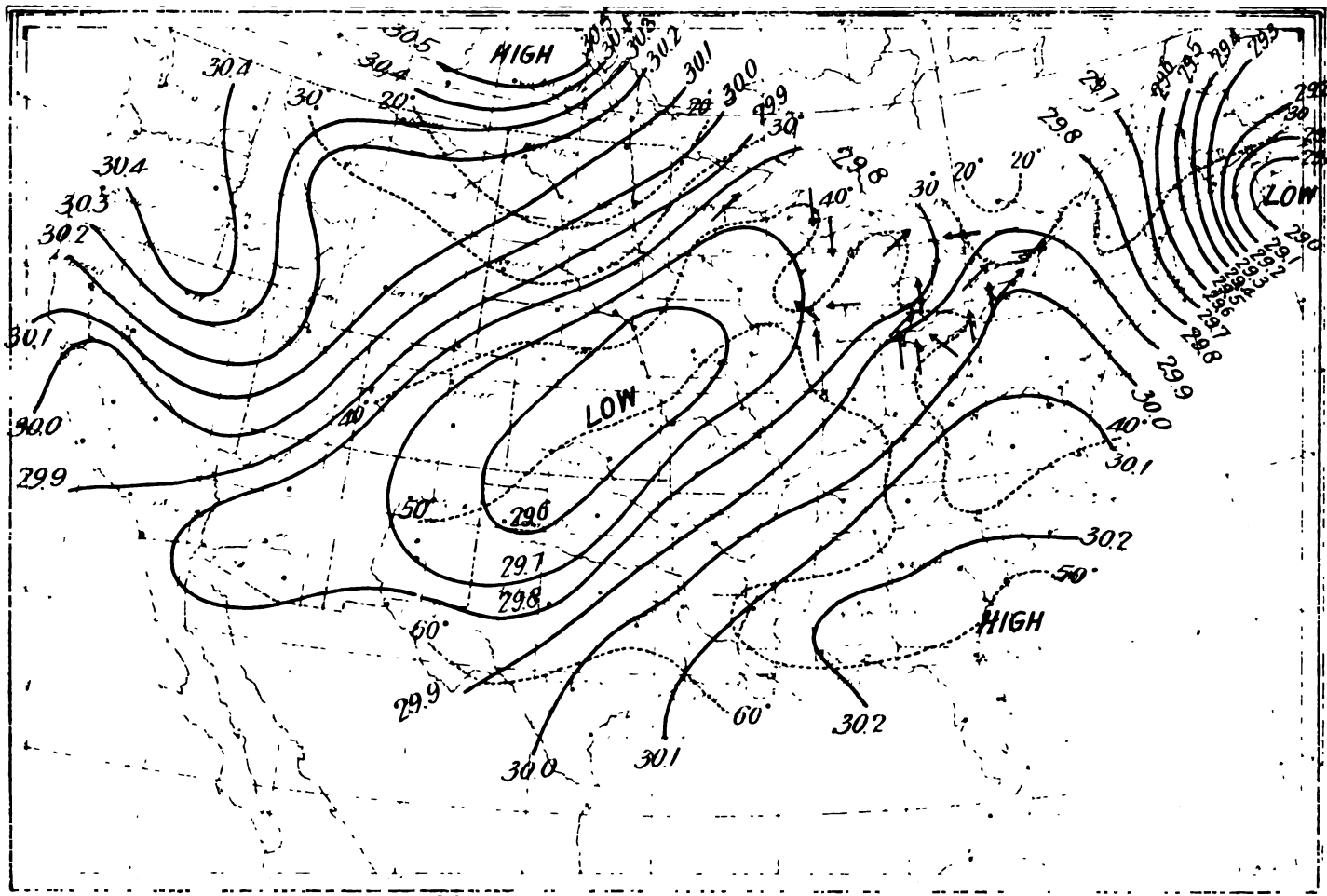


Chart OOLXII.

April 3, 1887—3 p. m.

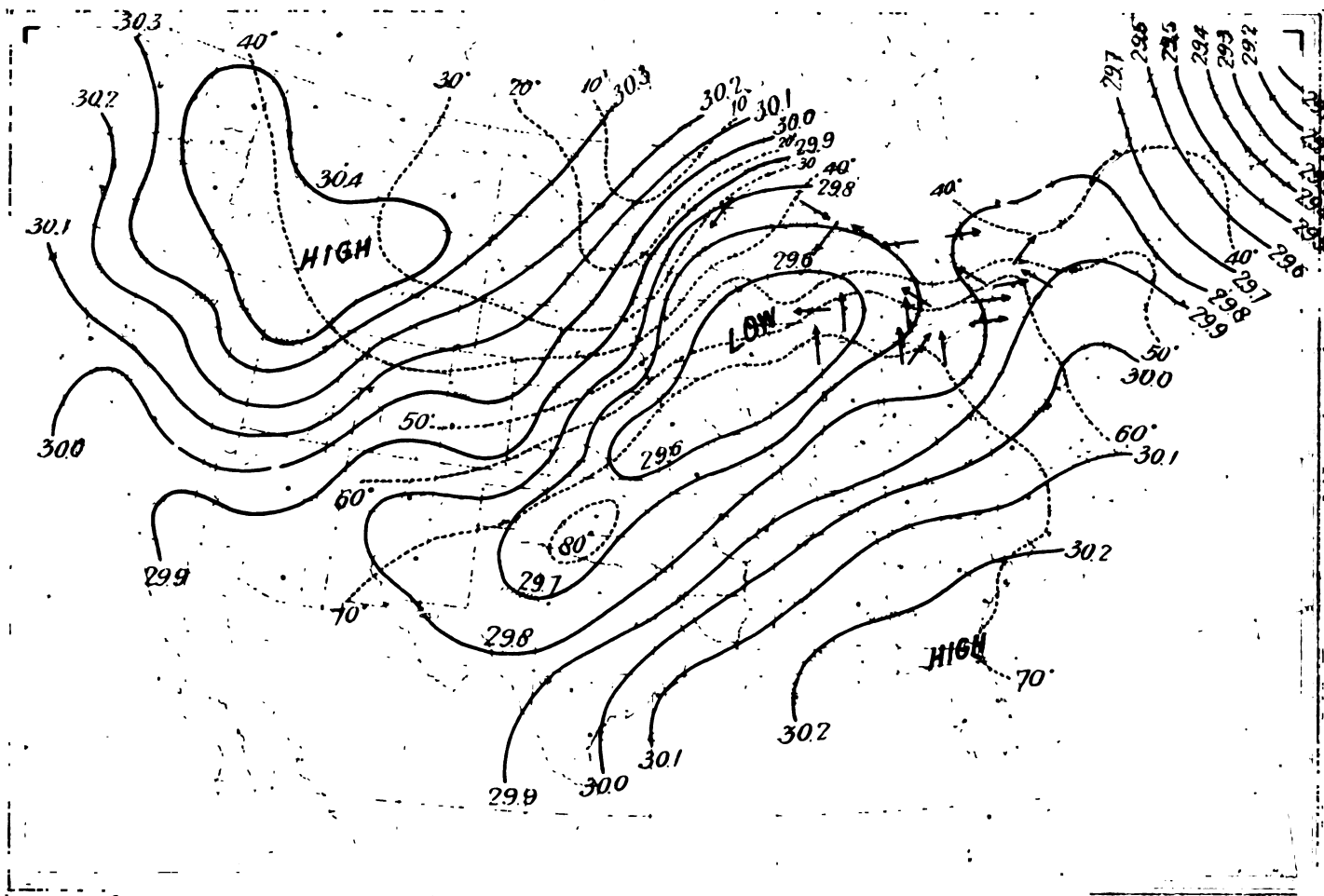


Chart COLXIII.

April 4, 1887—7 a. m.



Chart COLXIV.

April 4, 1887—3 p. m.

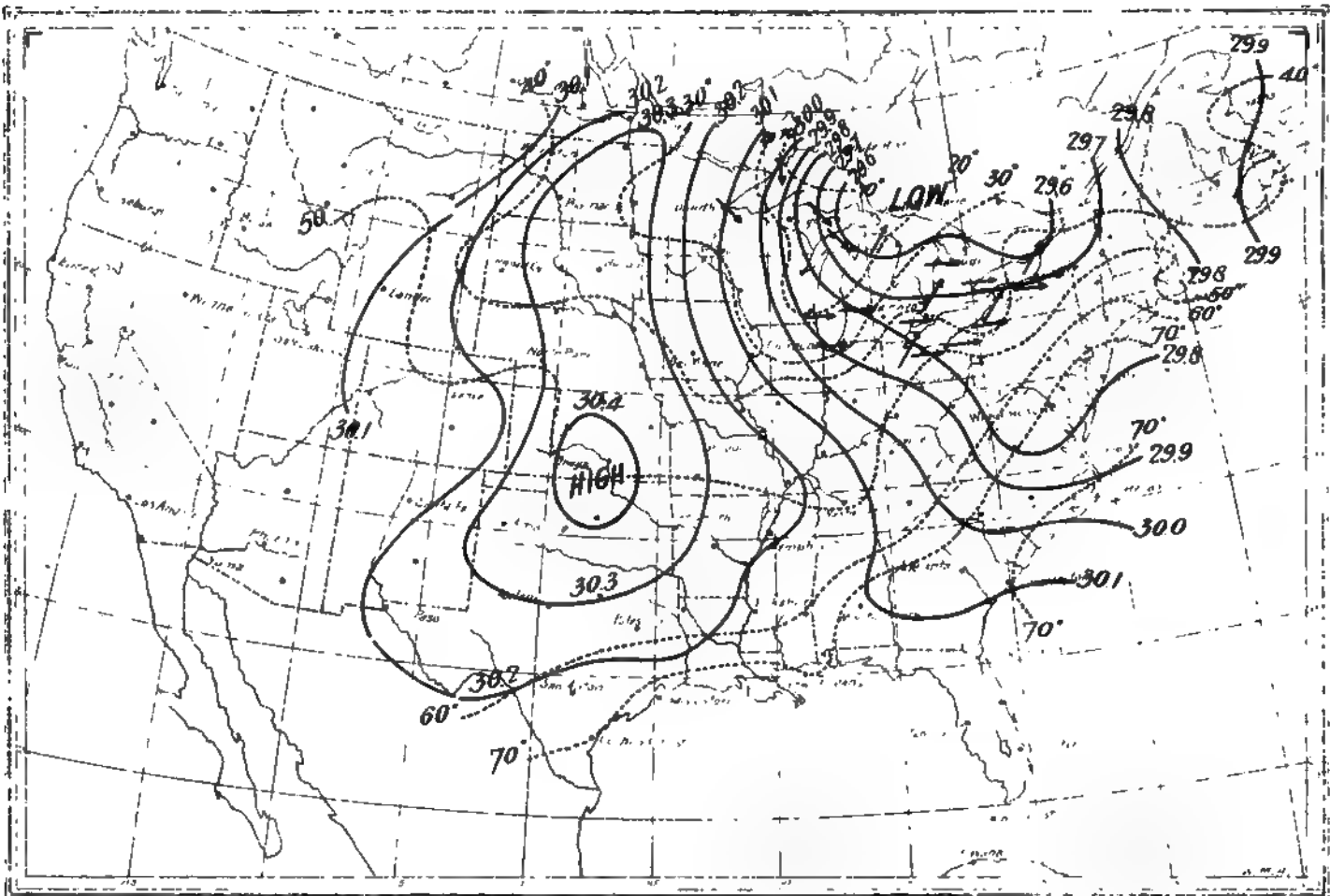


Chart CCLXV.

April 17, 1887--7 a. m.

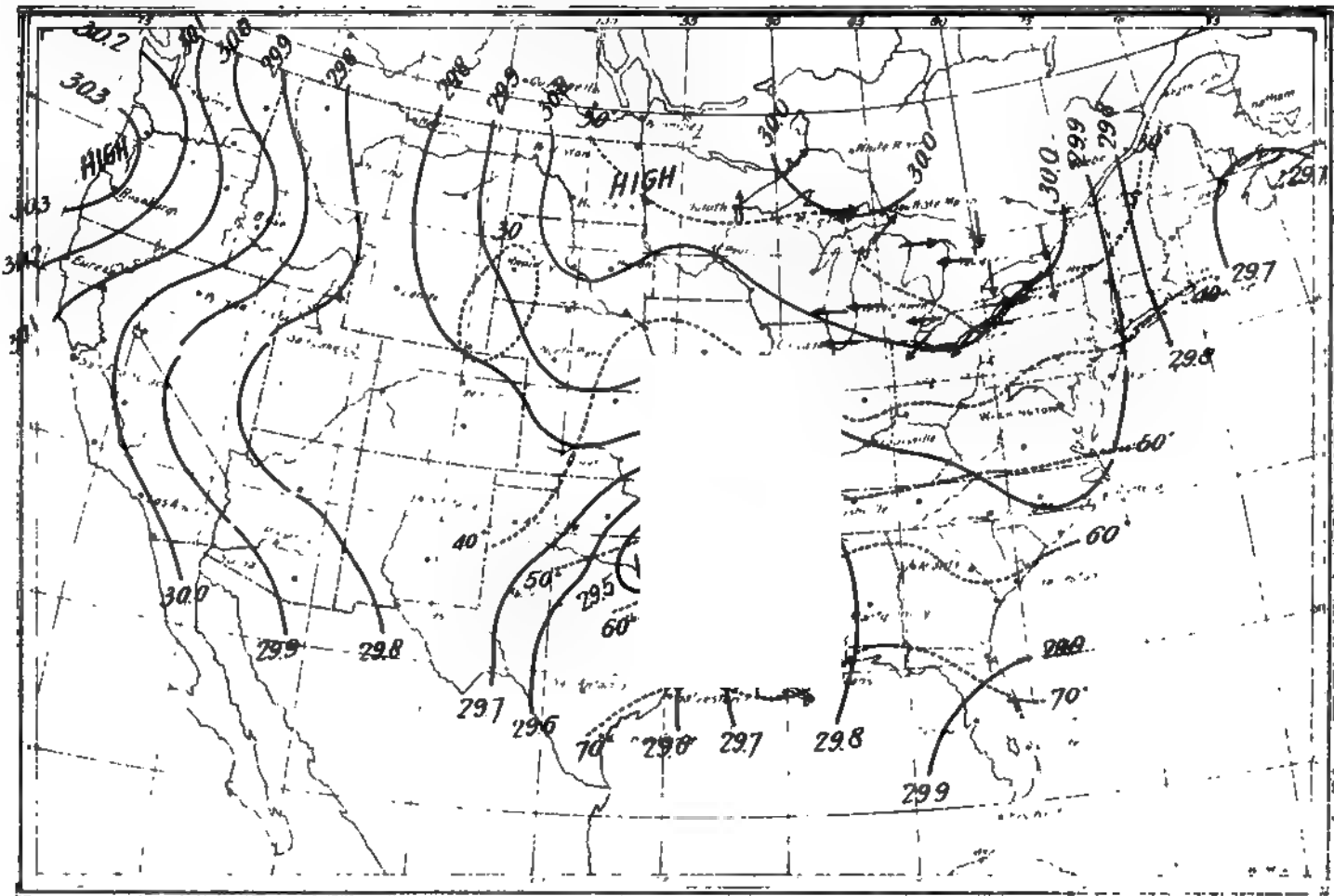


Chart CCLXVI.

April 17, 1887--3 p. m.

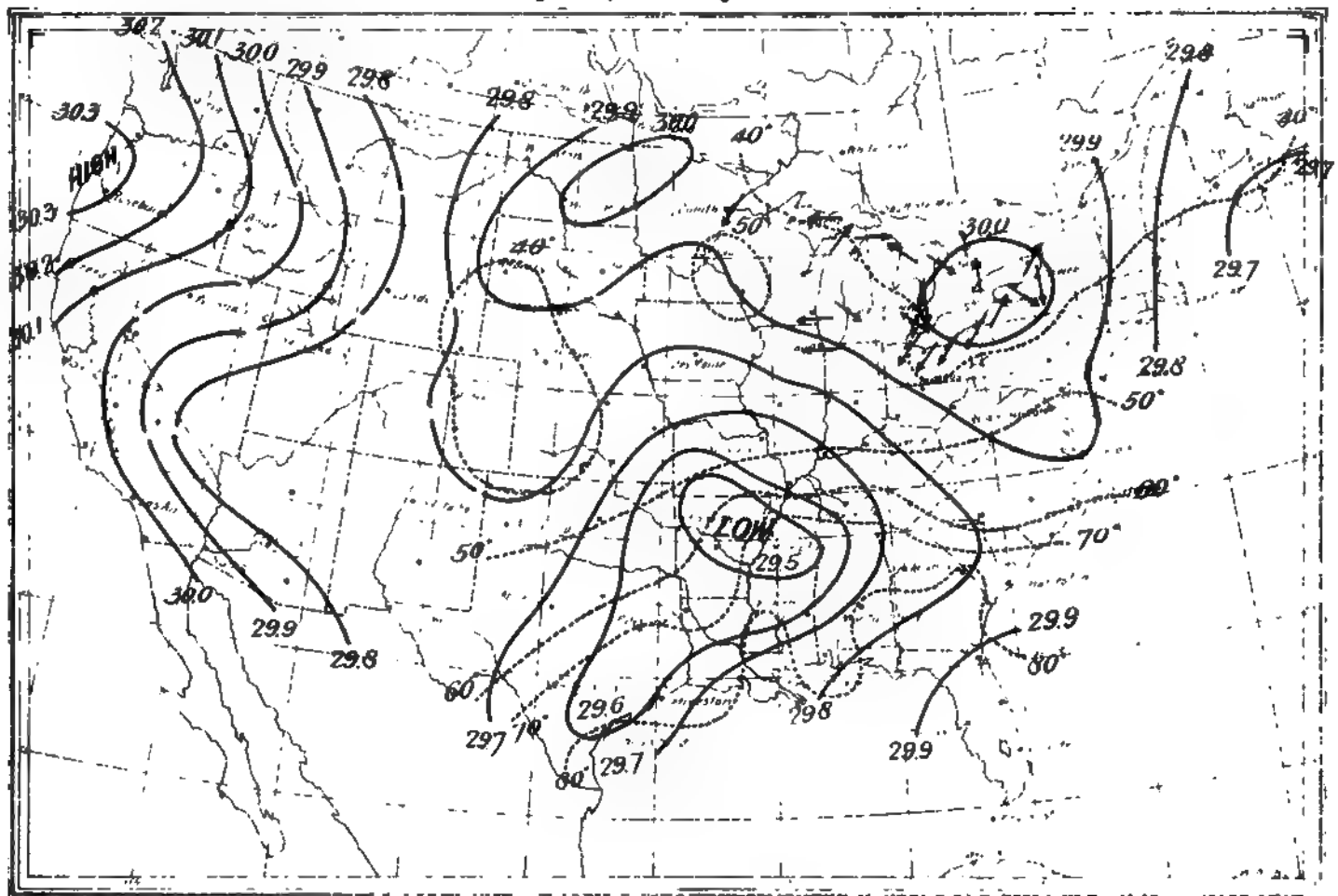


Chart OOLXVII.

April 18, 1887—7 a. m.

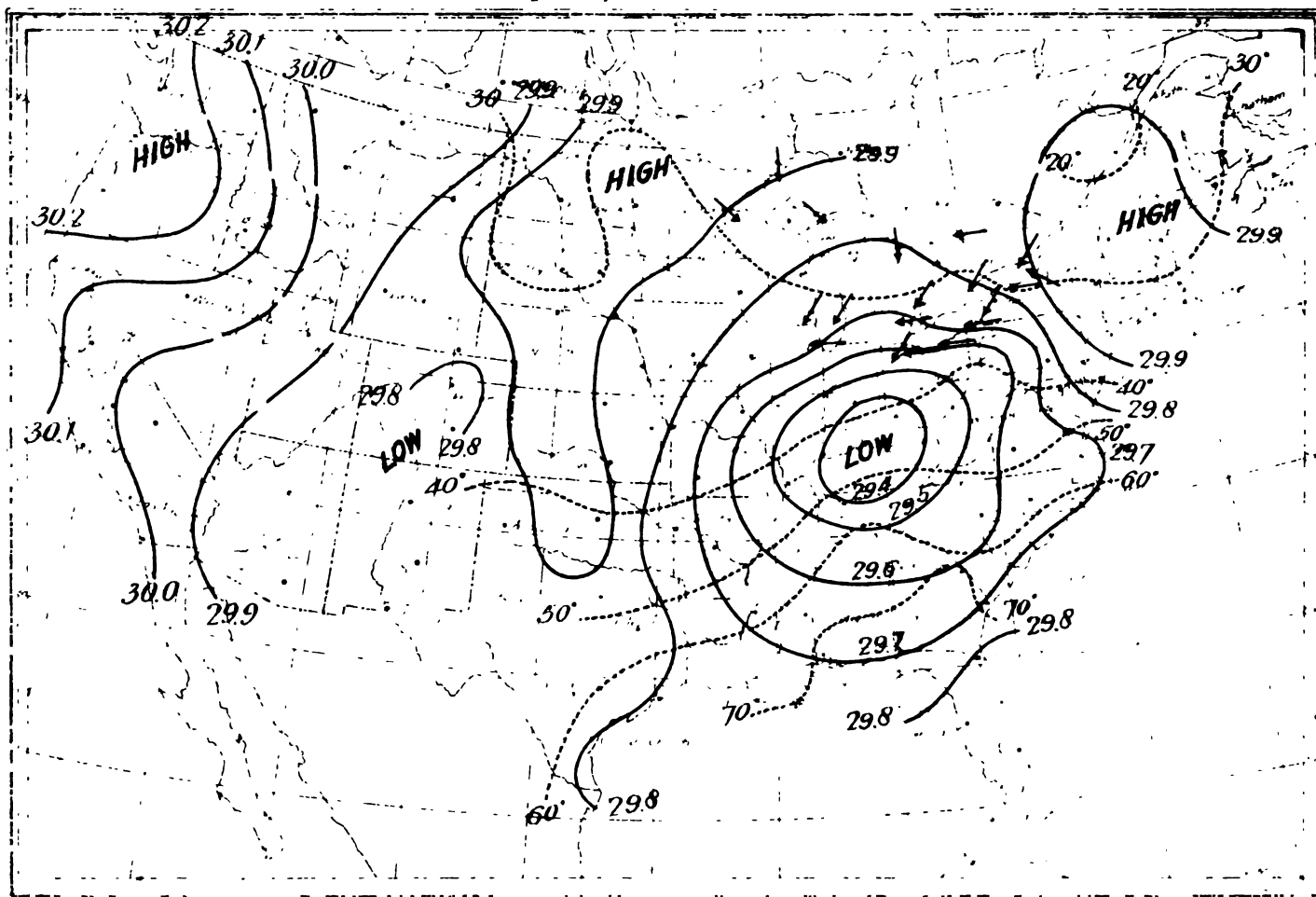


Chart OOLXVIII.

April 18, 1887—3 p. m.

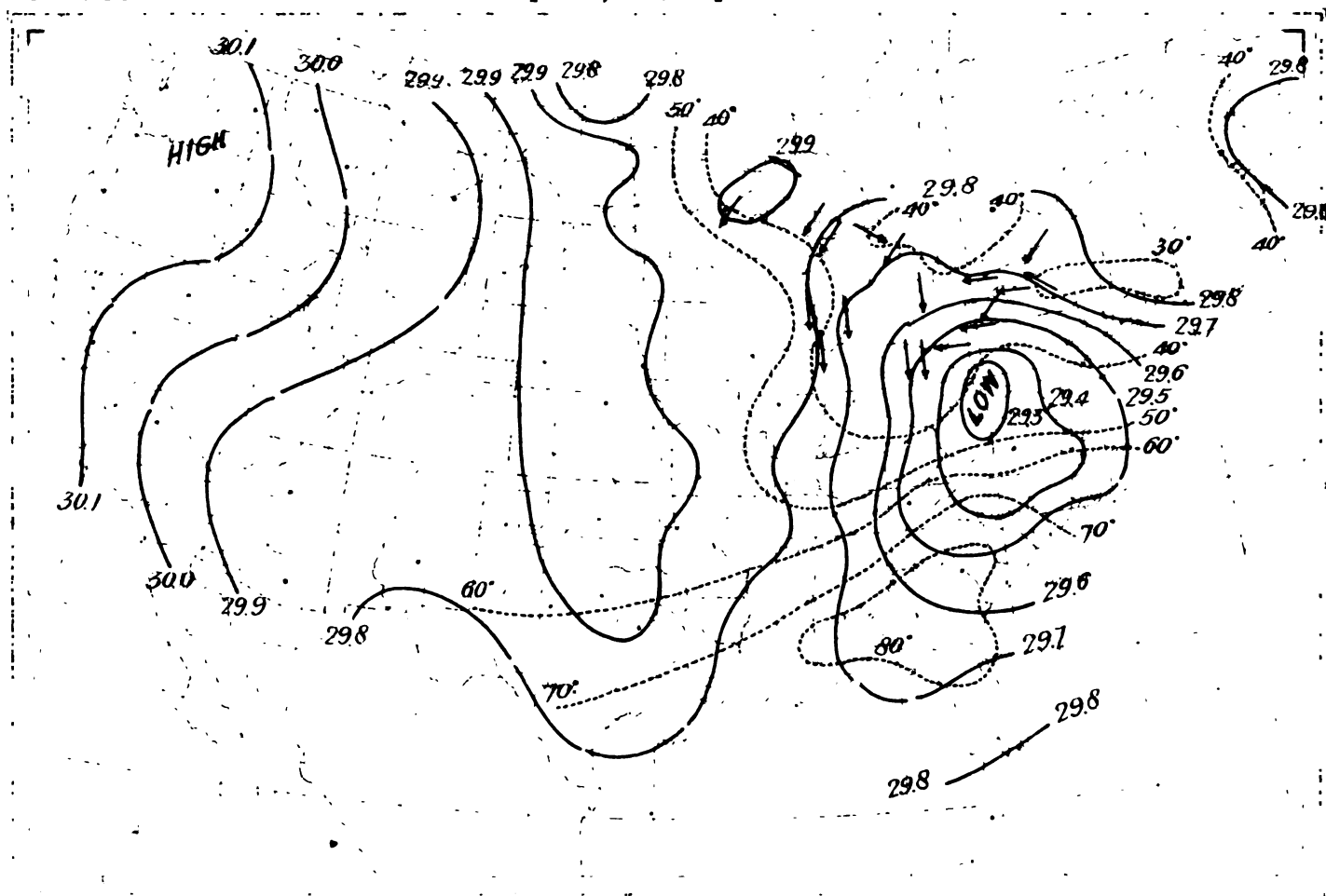


Chart COLXIX.

April 22, 1887-7 a. m.

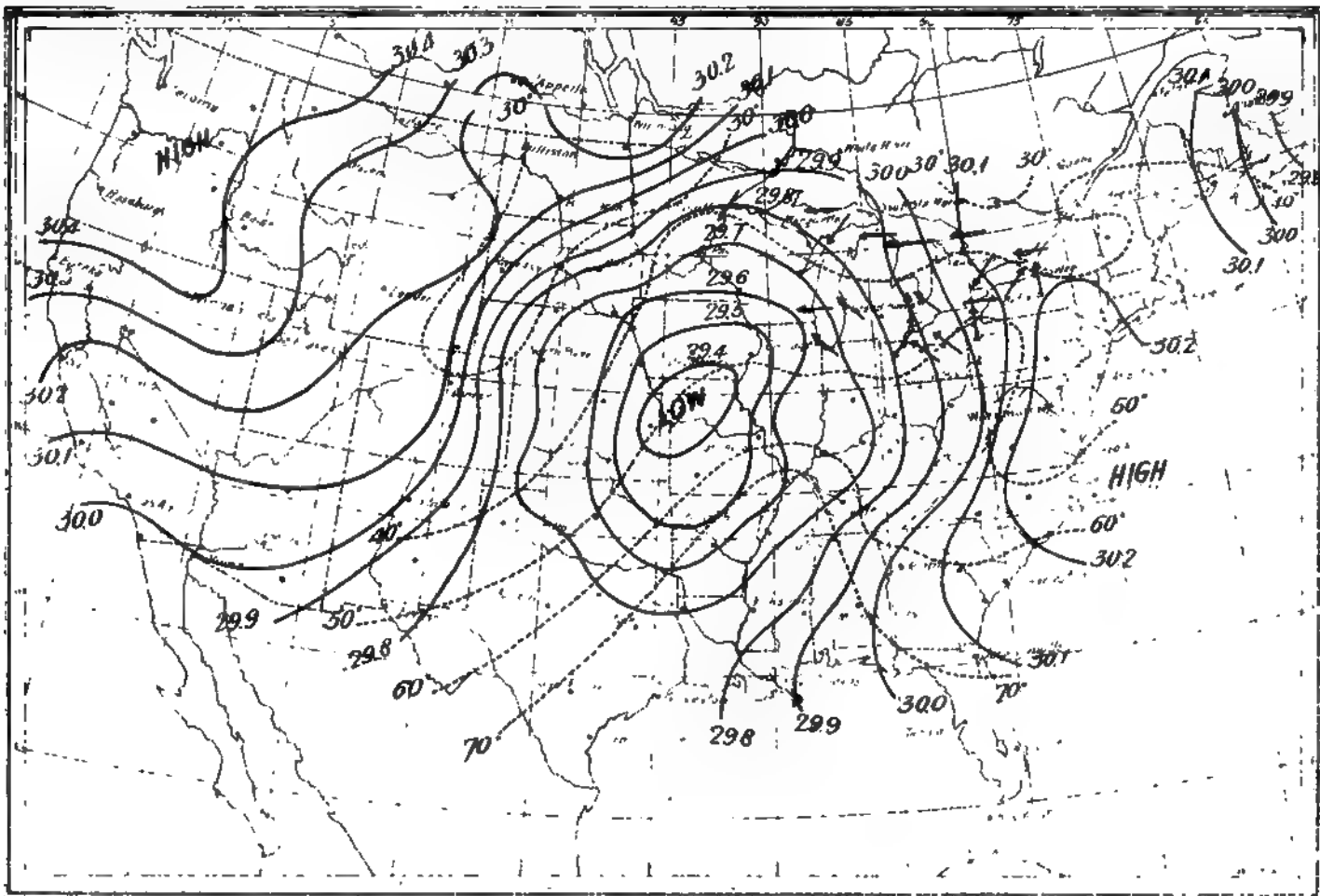
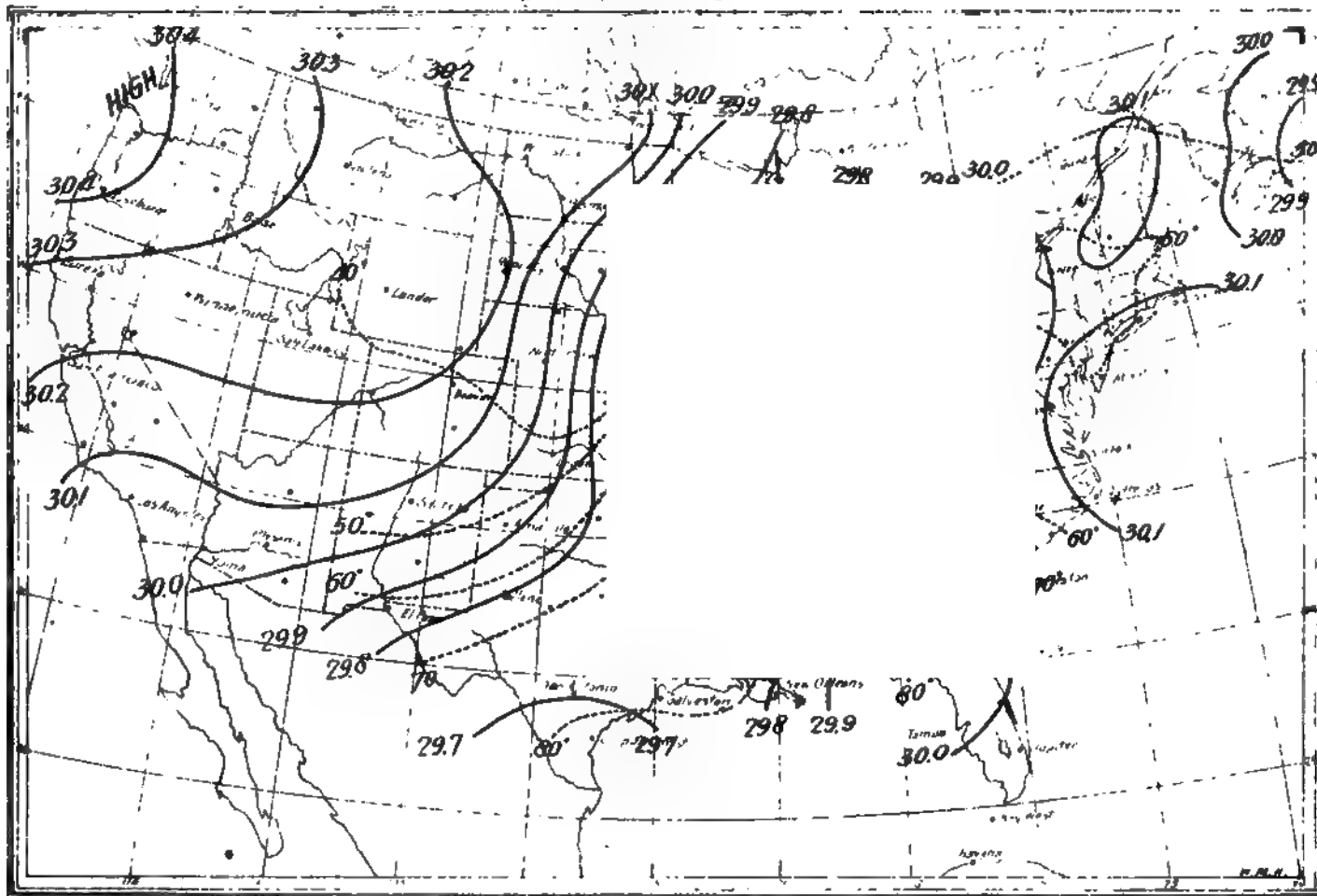
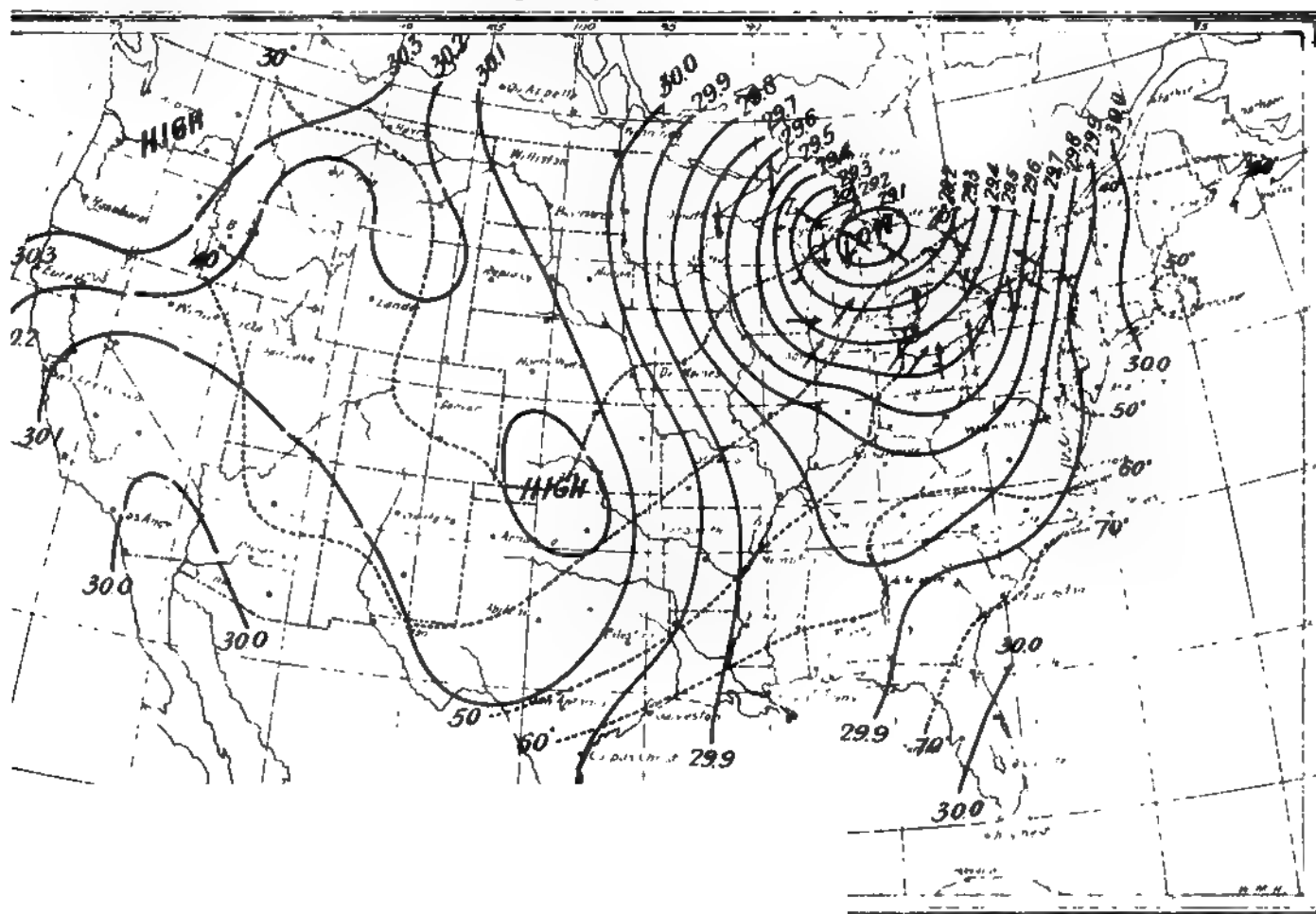


Chart COLXX.

April 22, 1887-3 p. m.



April 28, 1887—7 a. m.



April 23, 1887—3 p. m.

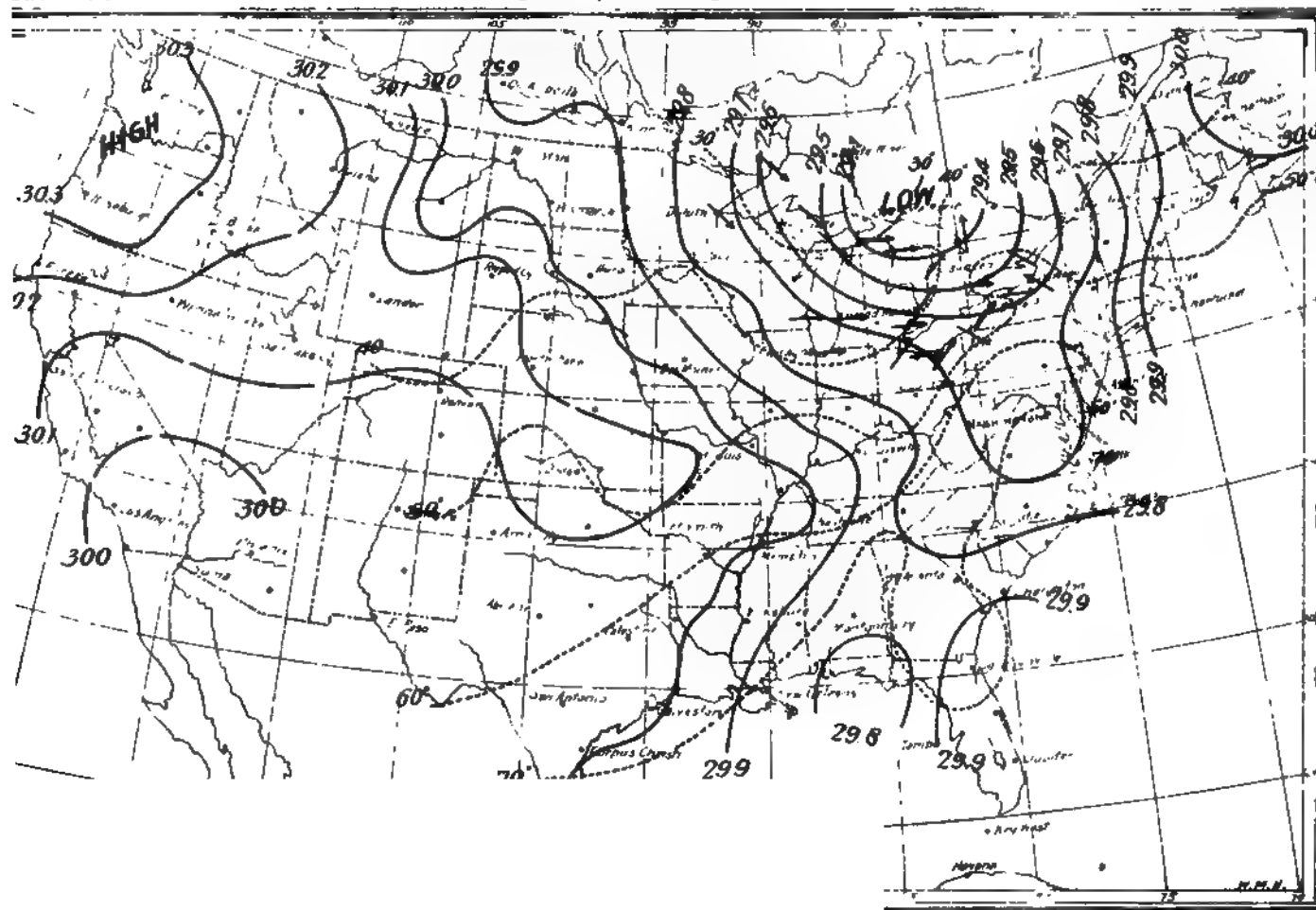


Chart OOLXXIII.

April 8, 1890—8 a. m.

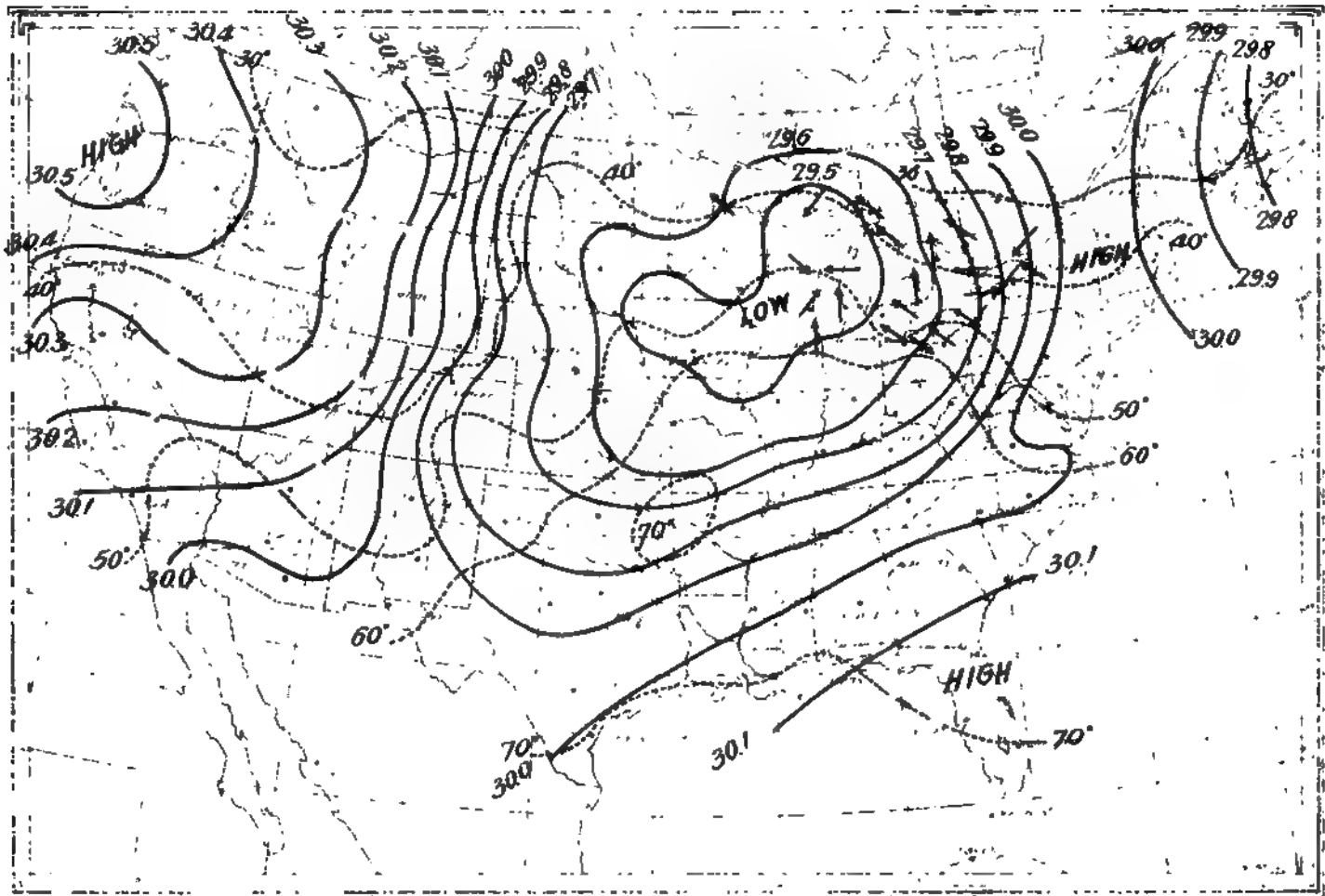


Chart OOLXXIV.

April 8, 1890—8 p. m.

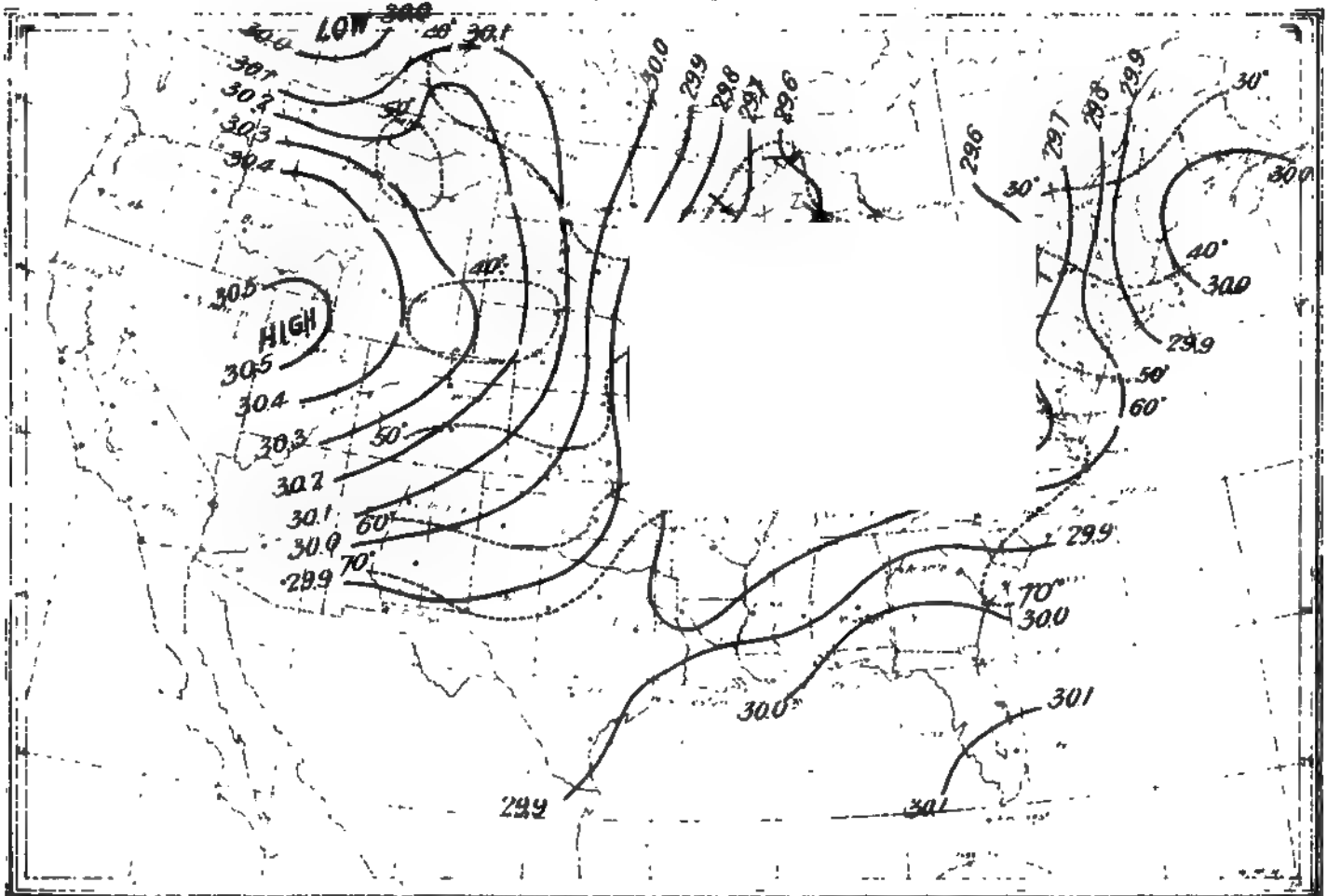


Chart COLXXV.

April 9, 1890—8 a. m.

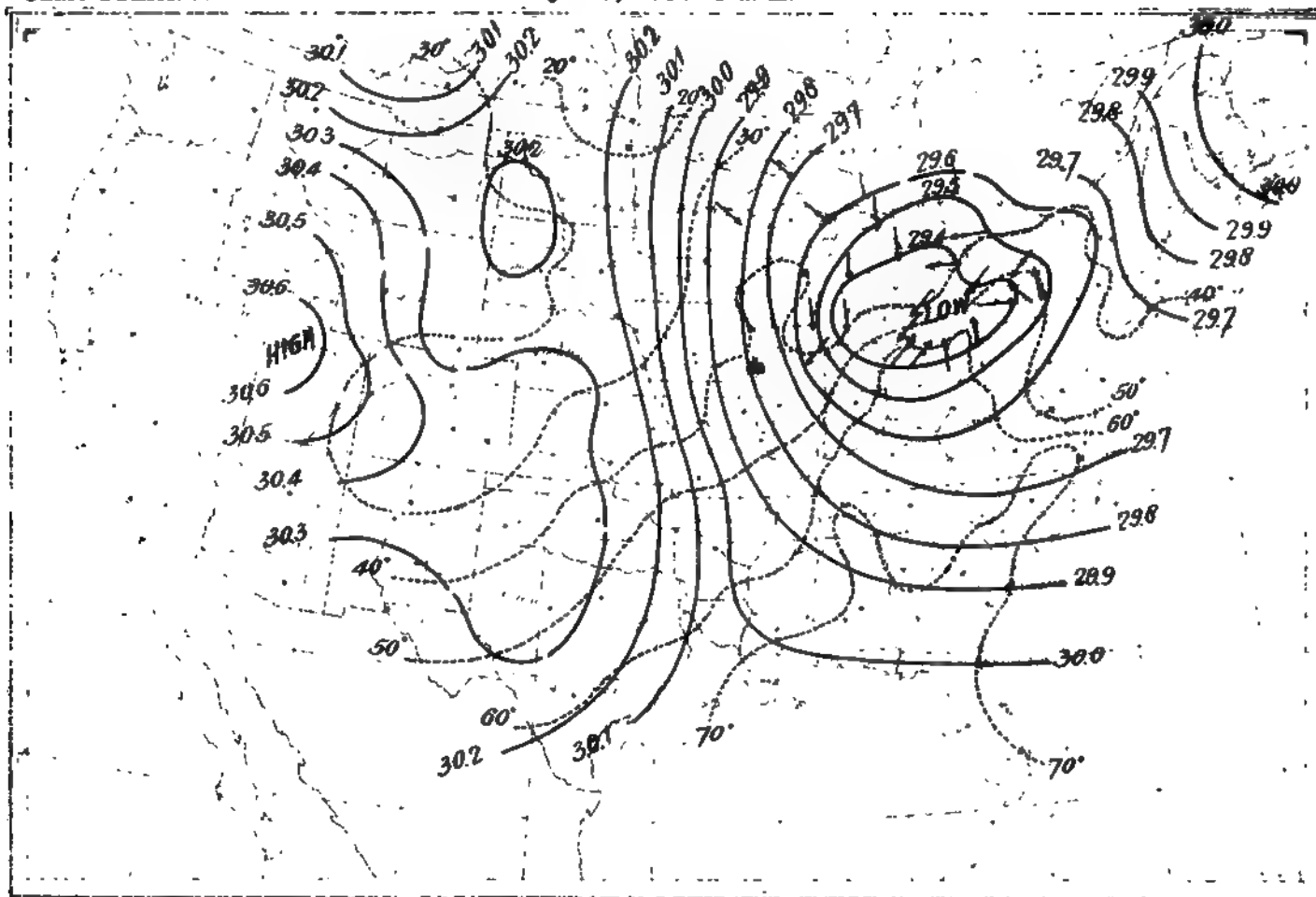


Chart COLXXVI.

April 9, 1890—8 p. m.

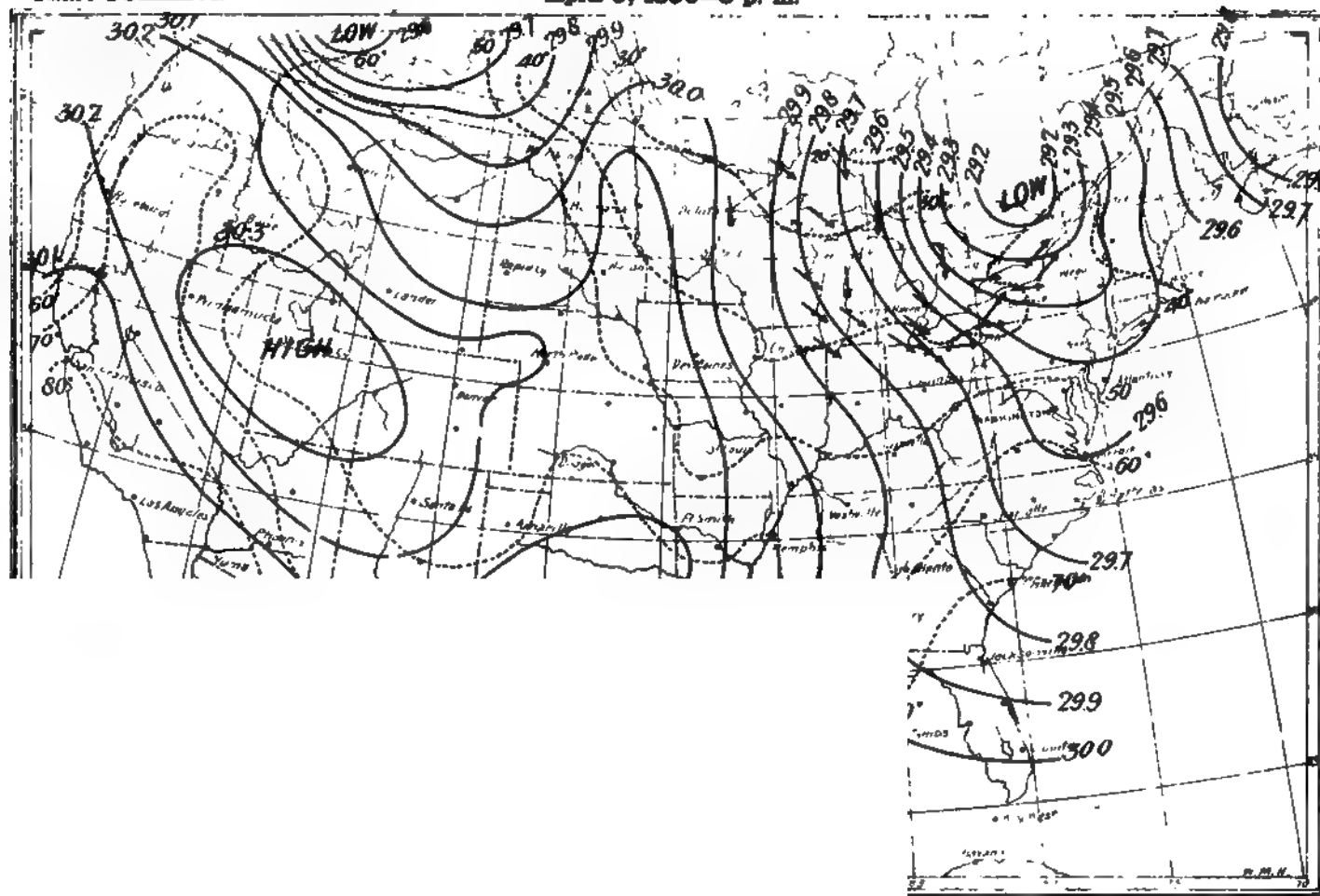


Chart CCLXXVII.

April 19, 1898—8 a. m.

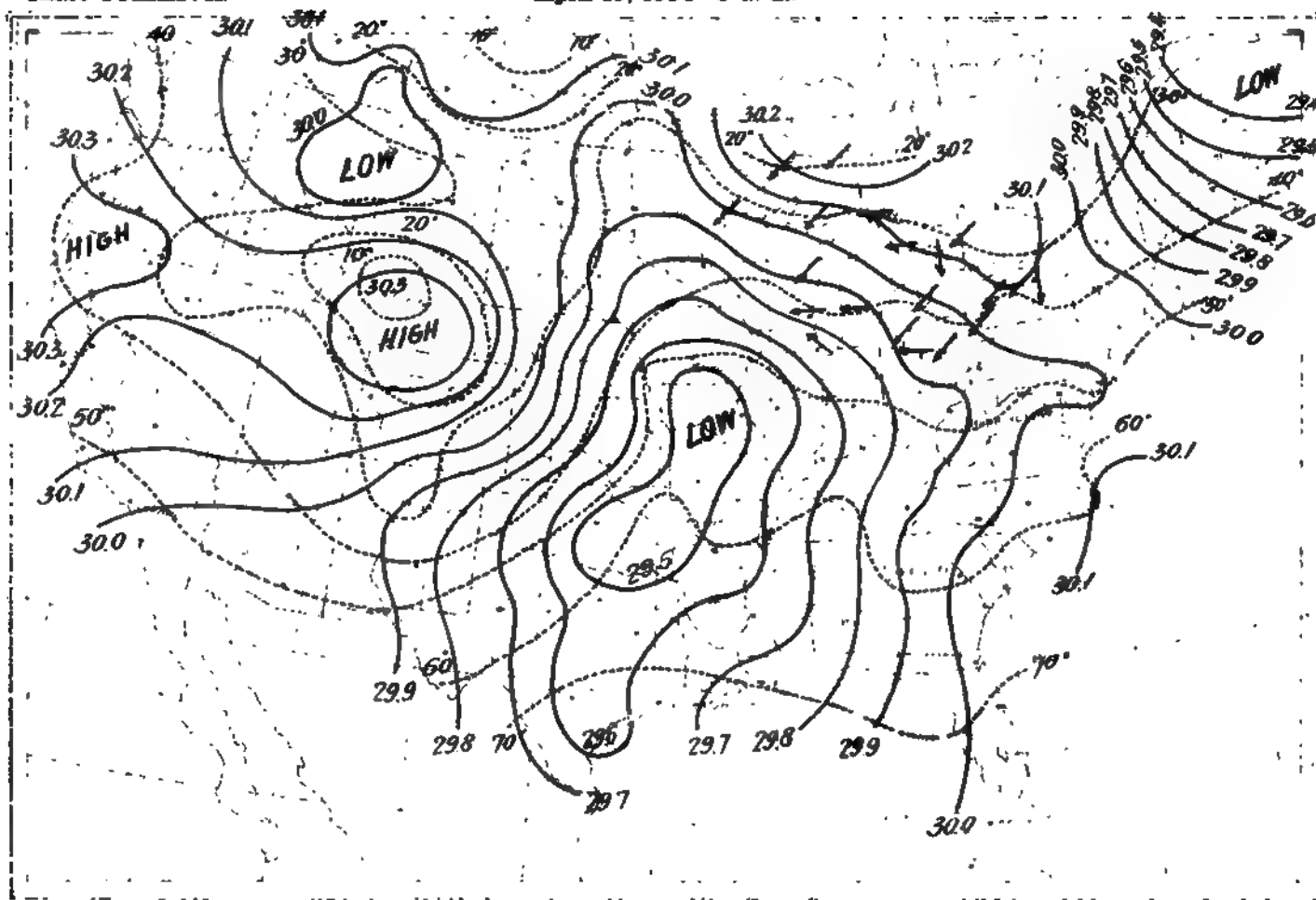


Chart CCLXXVIII.

April 19, 1898—8 p. m.

Chart OOLXXIX

April 20, 1893—8 a. m.

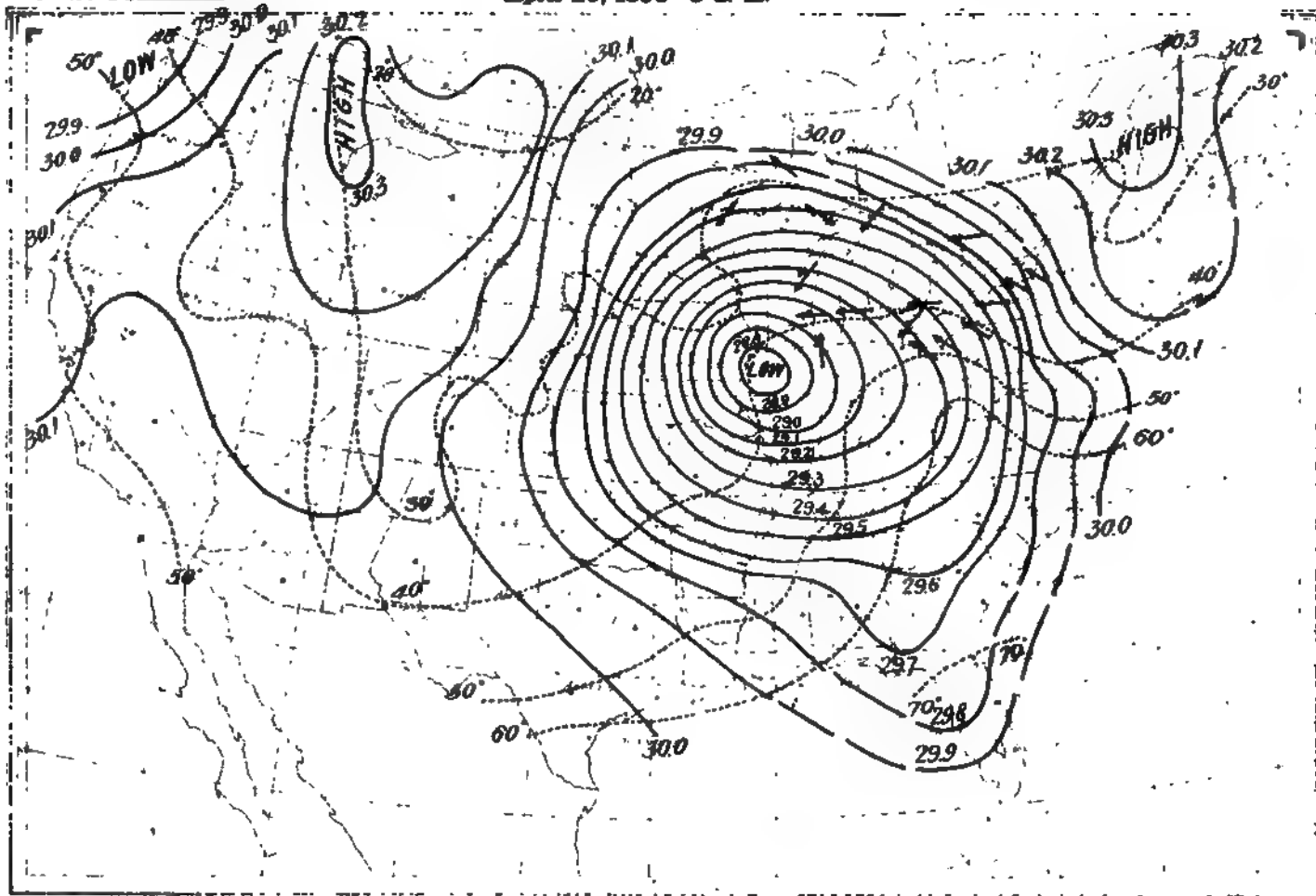


Chart OOLXXX

April 20, 1893—8 p. m.

Chart COLXXXI.

April 17, 1897—8 p. m.

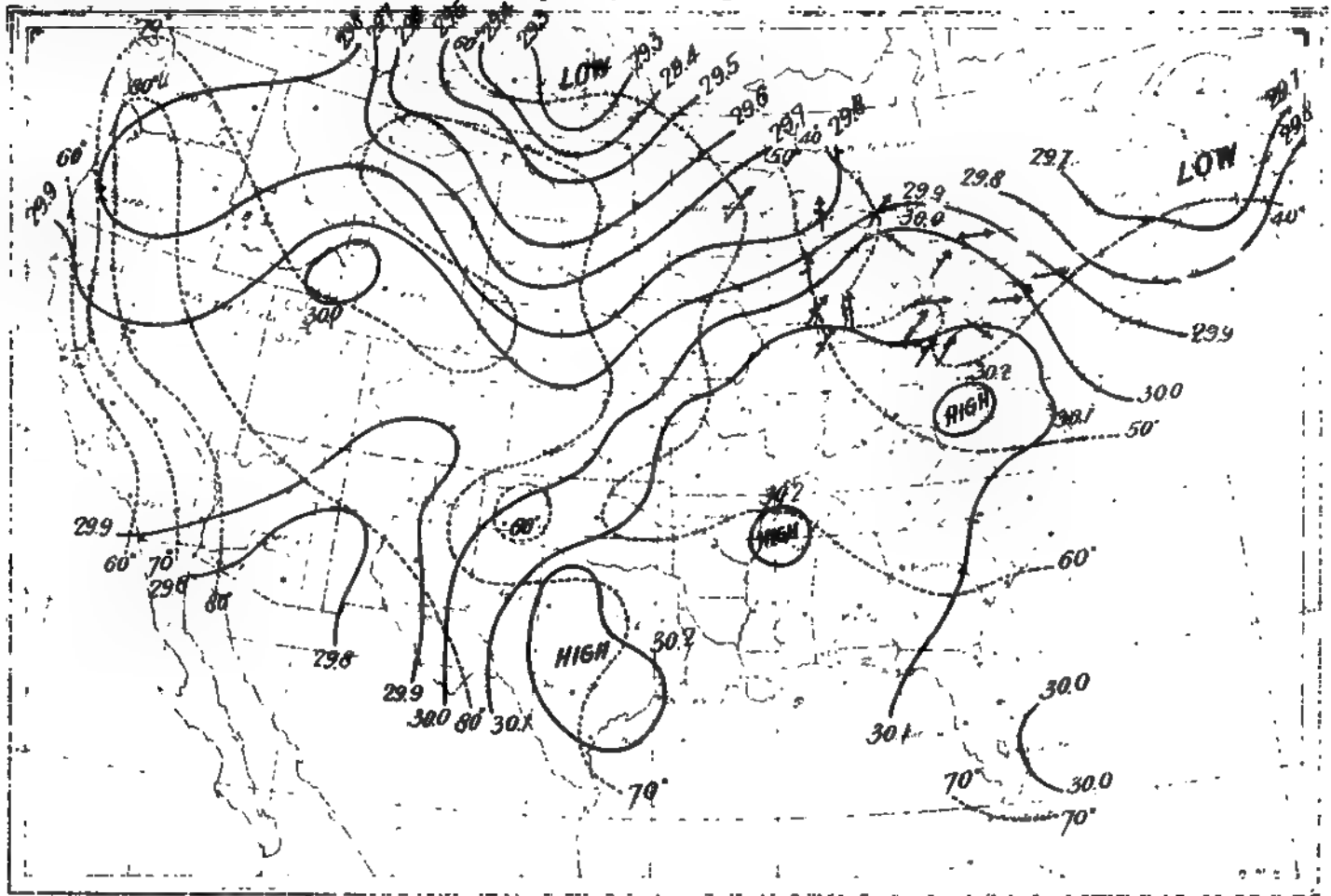


Chart COLXXXII.

April 18, 1897—8 a. m.

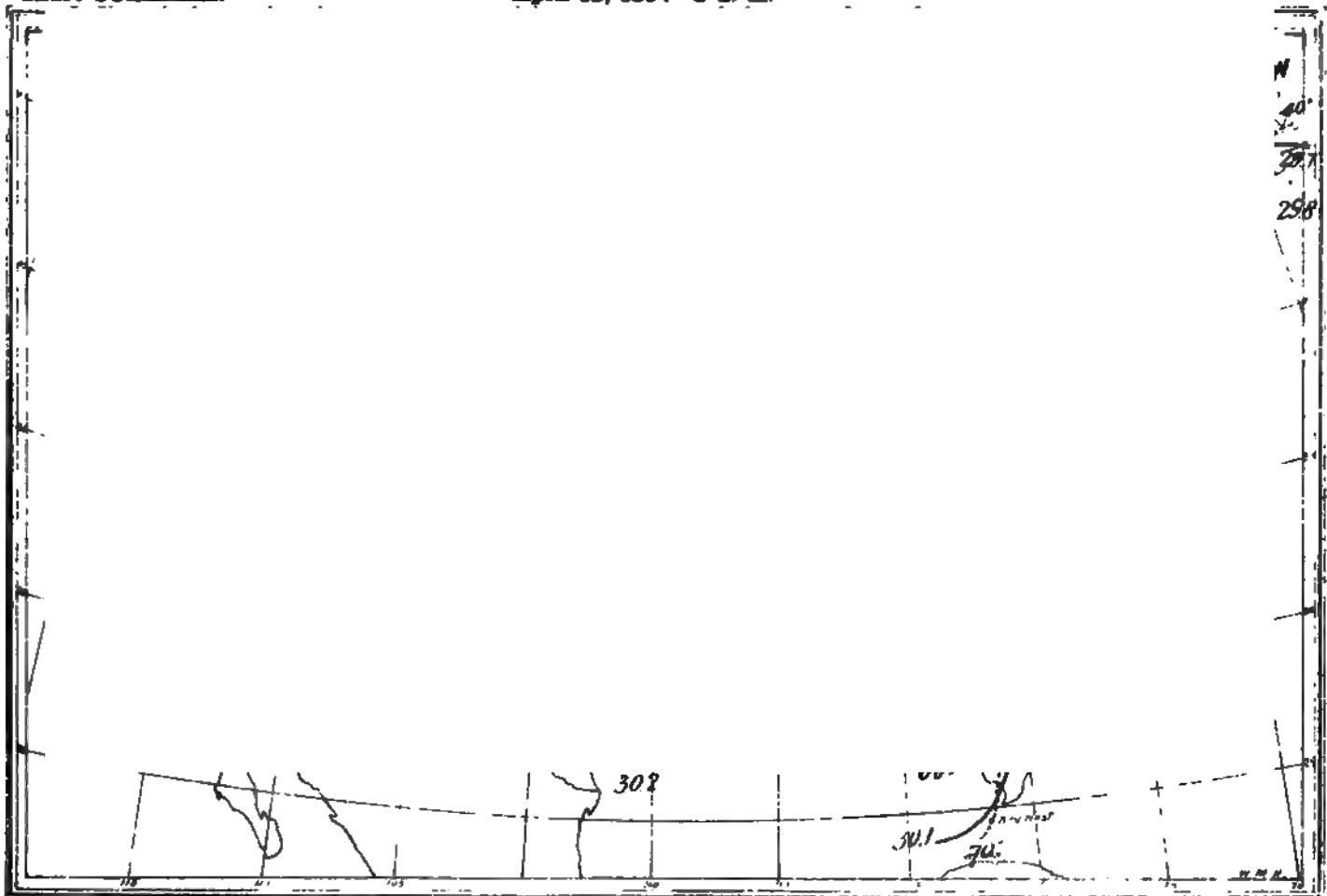


Chart CCLXXXIII.

April 18, 1897—8 p. m.

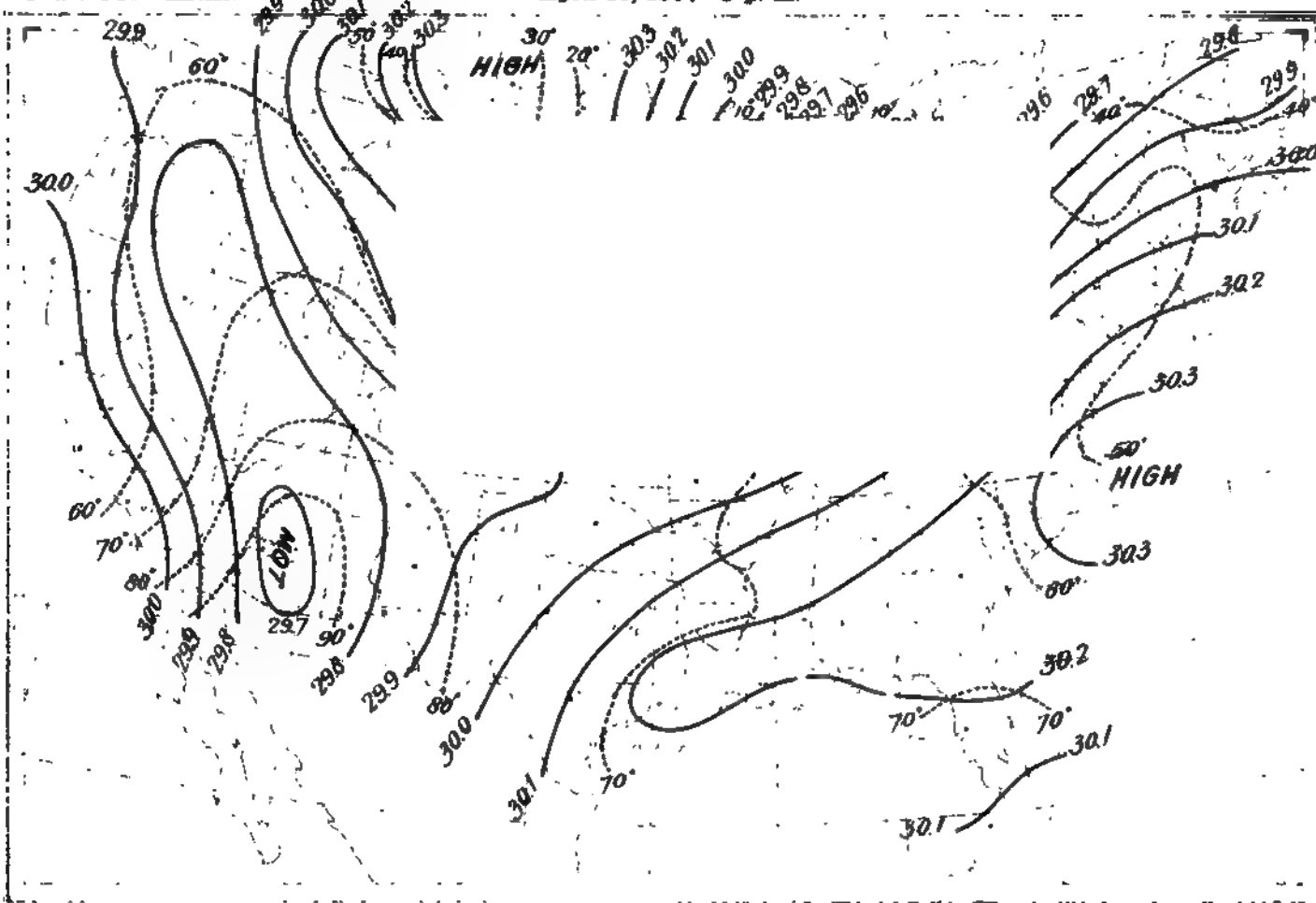


Chart CCLXXXIV.

April 19, 1897—8 a. m.

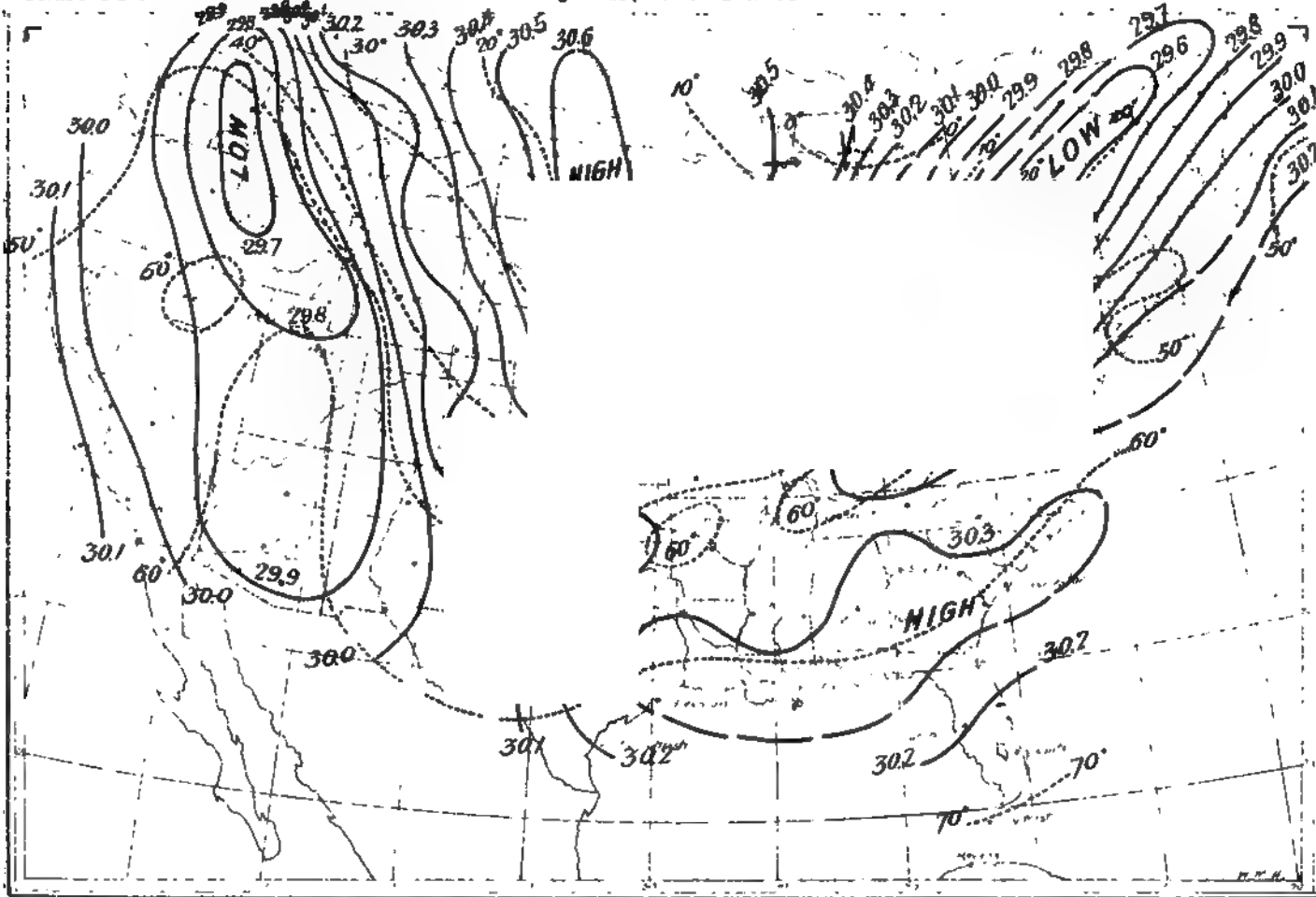


Chart OOLXXXV.

April 12, 1898—8 a. m.

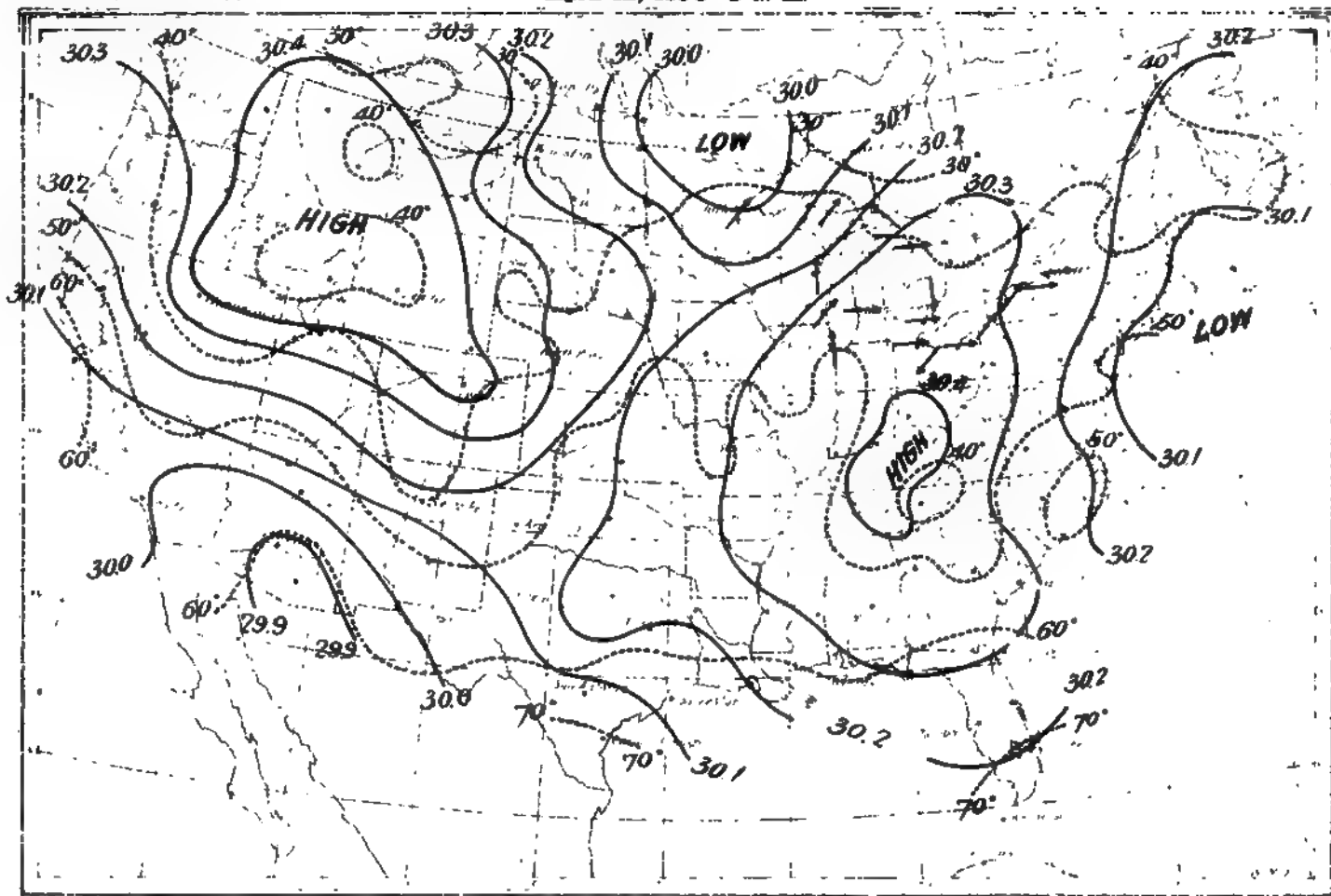


Chart OOLXXXVI.

April 12, 1898—8 p. m.

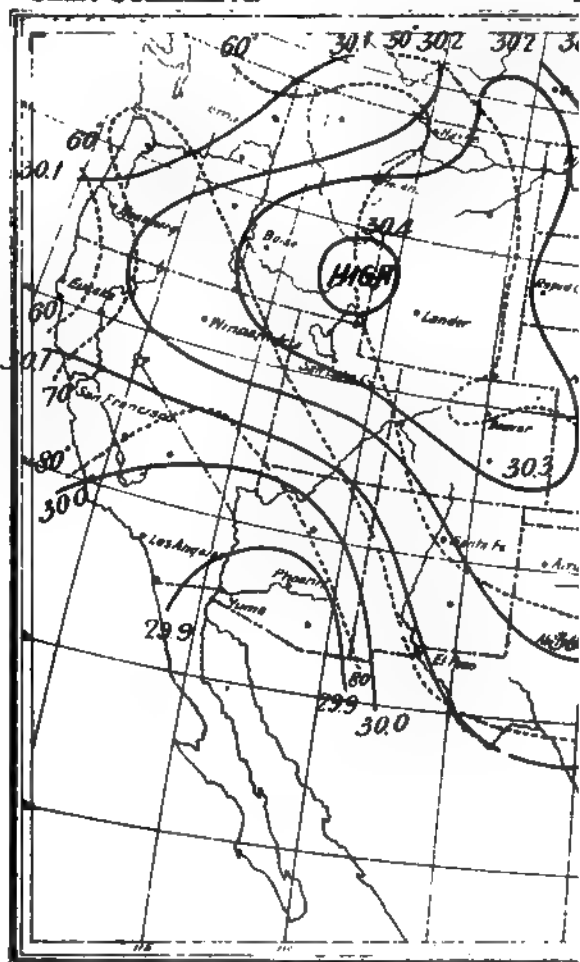


Chart COLXXXVII.

April 18, 1898—8 a. m.

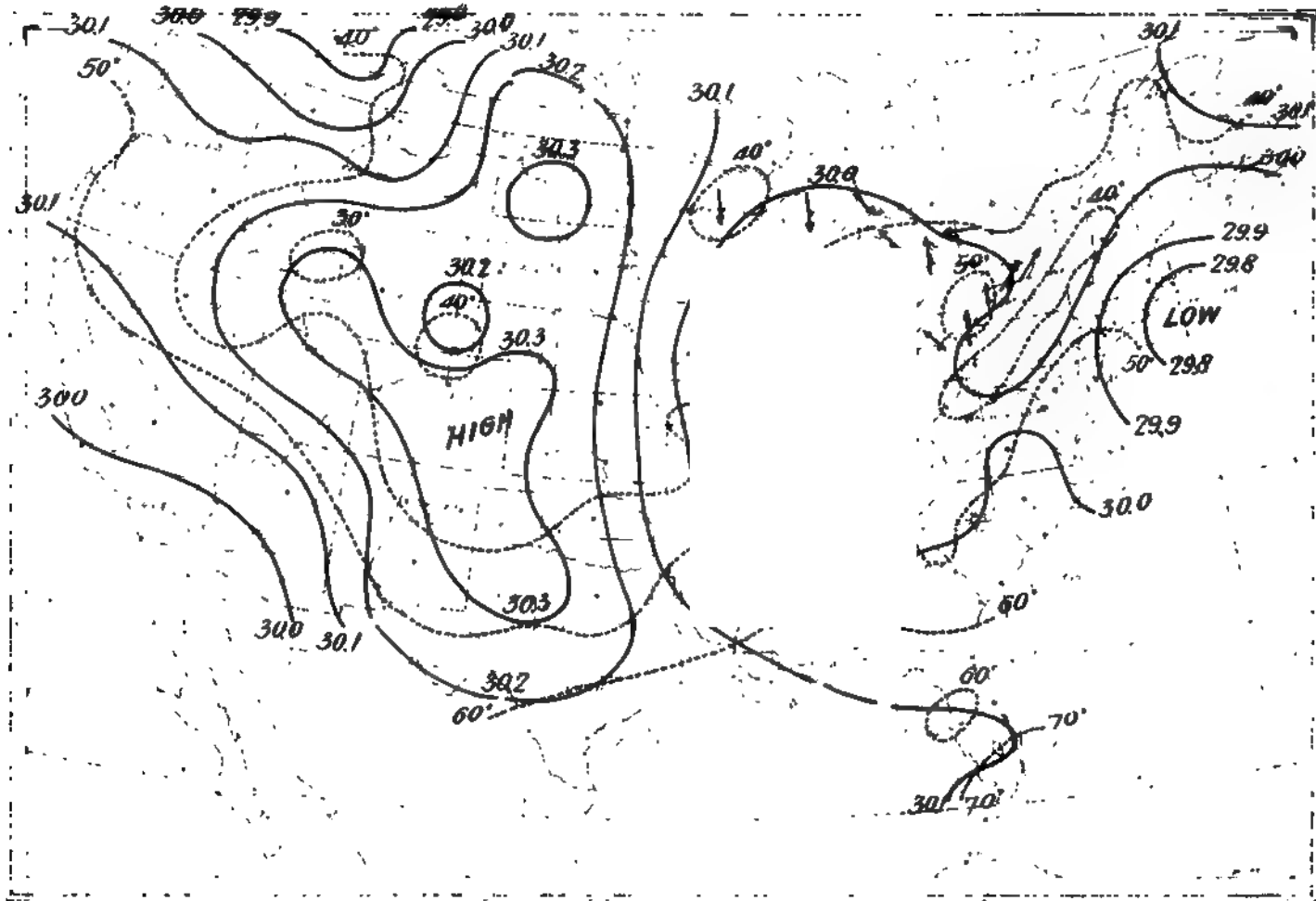


Chart COLXXXVIII.

April 18, 1898—8 p. m.

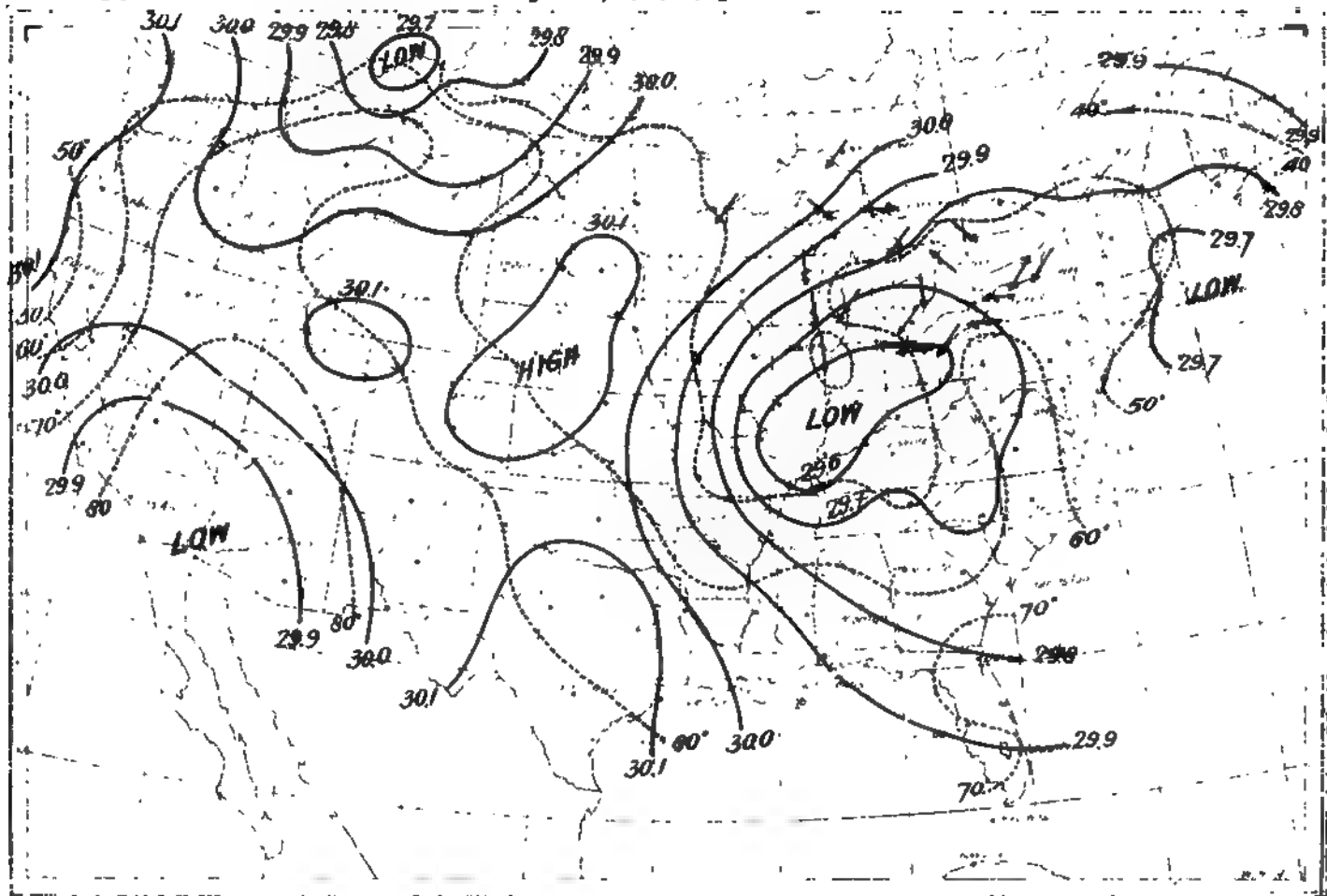


Chart OOXOI.

May 3, 1876—7:35 a. m.

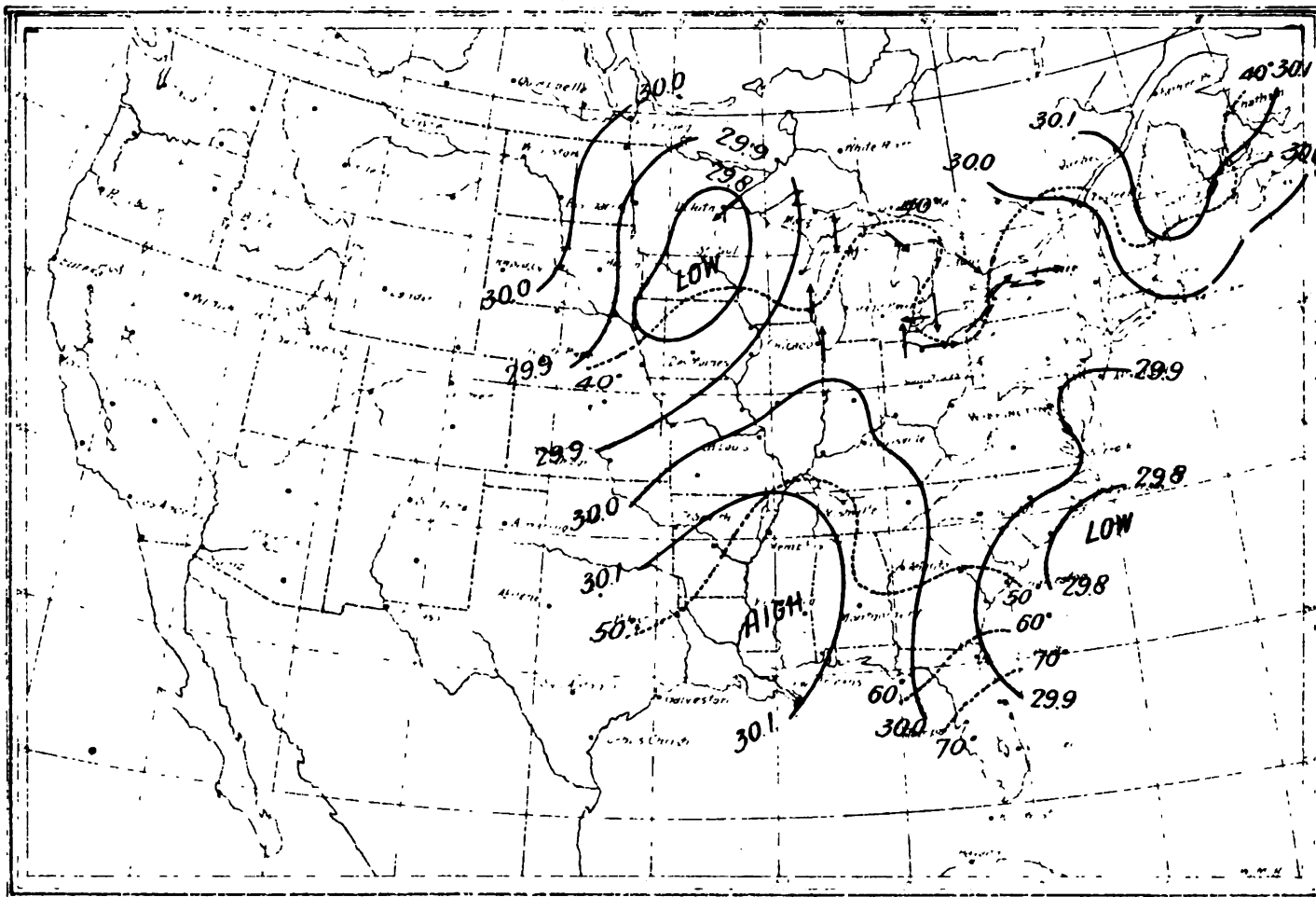


Chart OOXOII.

May 3, 1876—4:35 p. m.

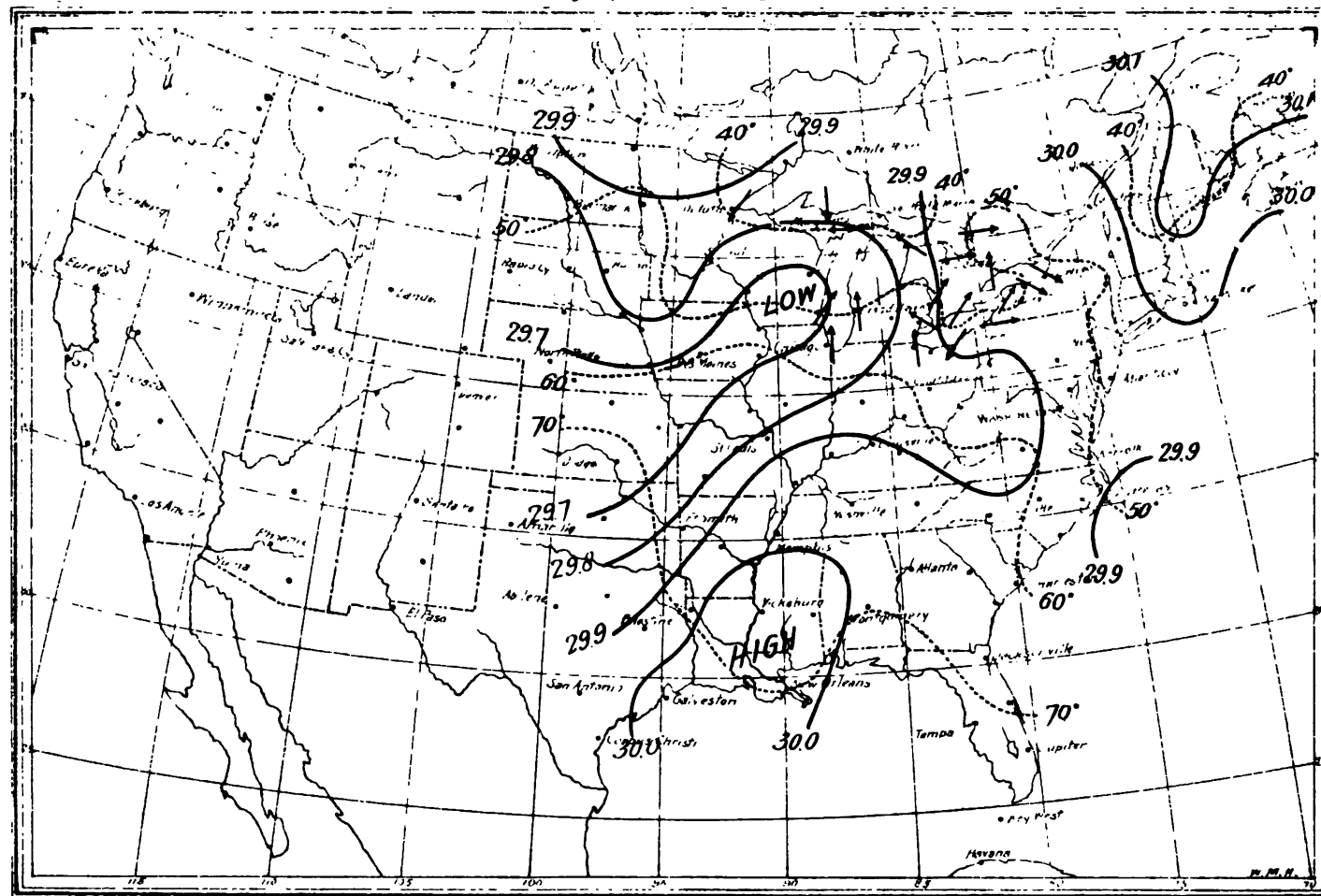


Chart CXXOIII.

May 19, 1878—7:35 a. m.

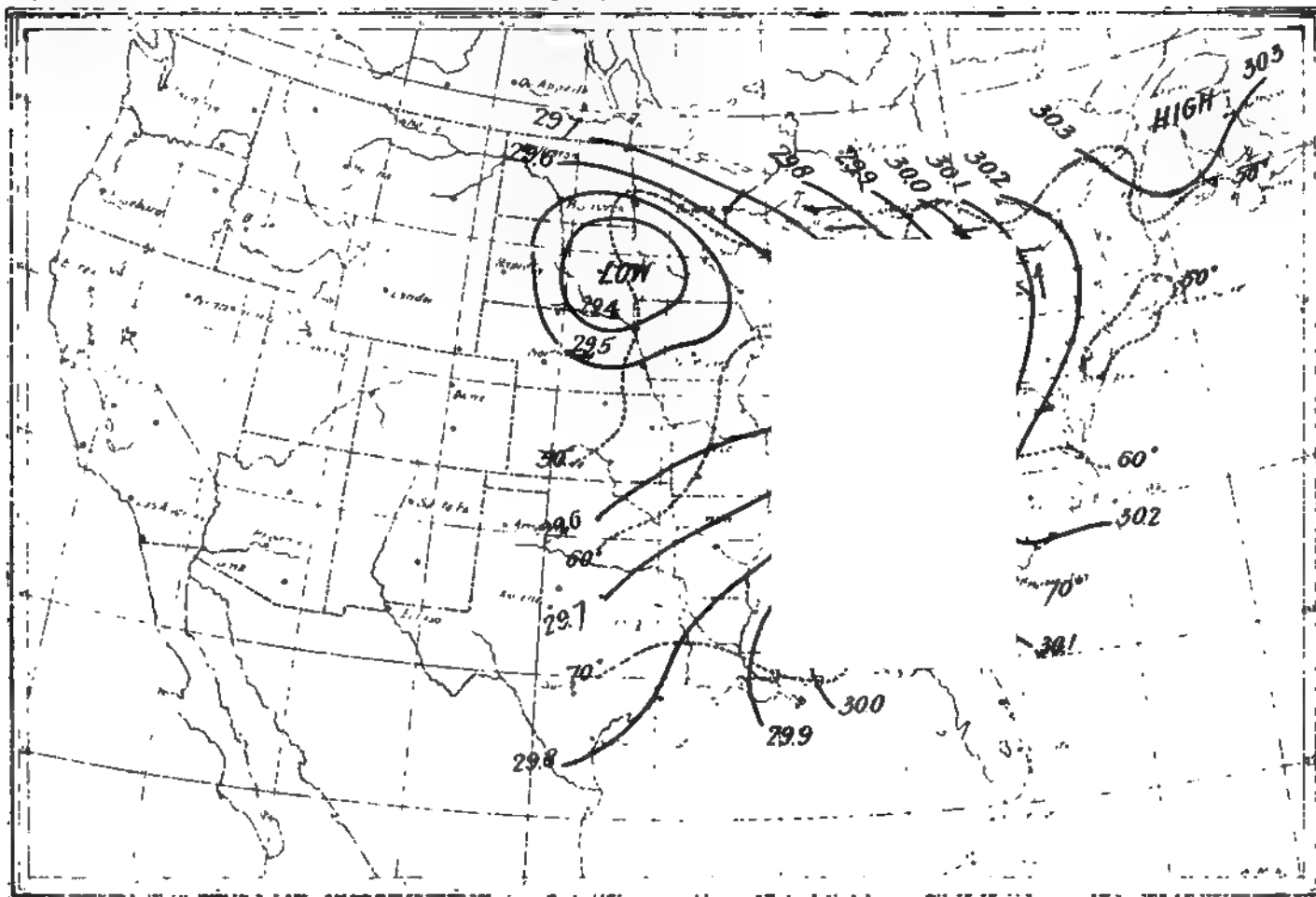


Chart CXXOIV.

May 19, 1878—4:35 p. m.

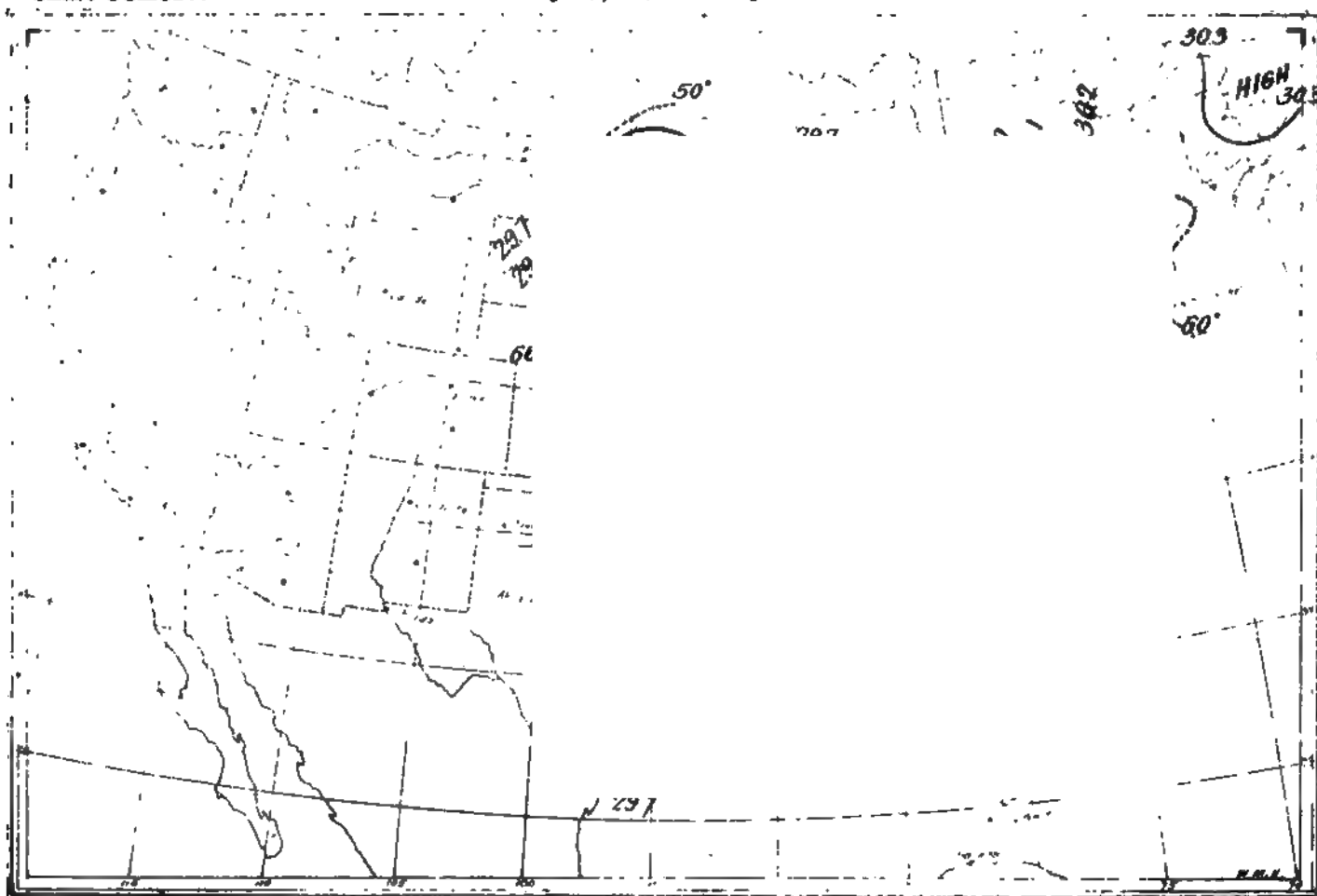


Chart CXXOV.

May 20, 1878—7:35 a. m.

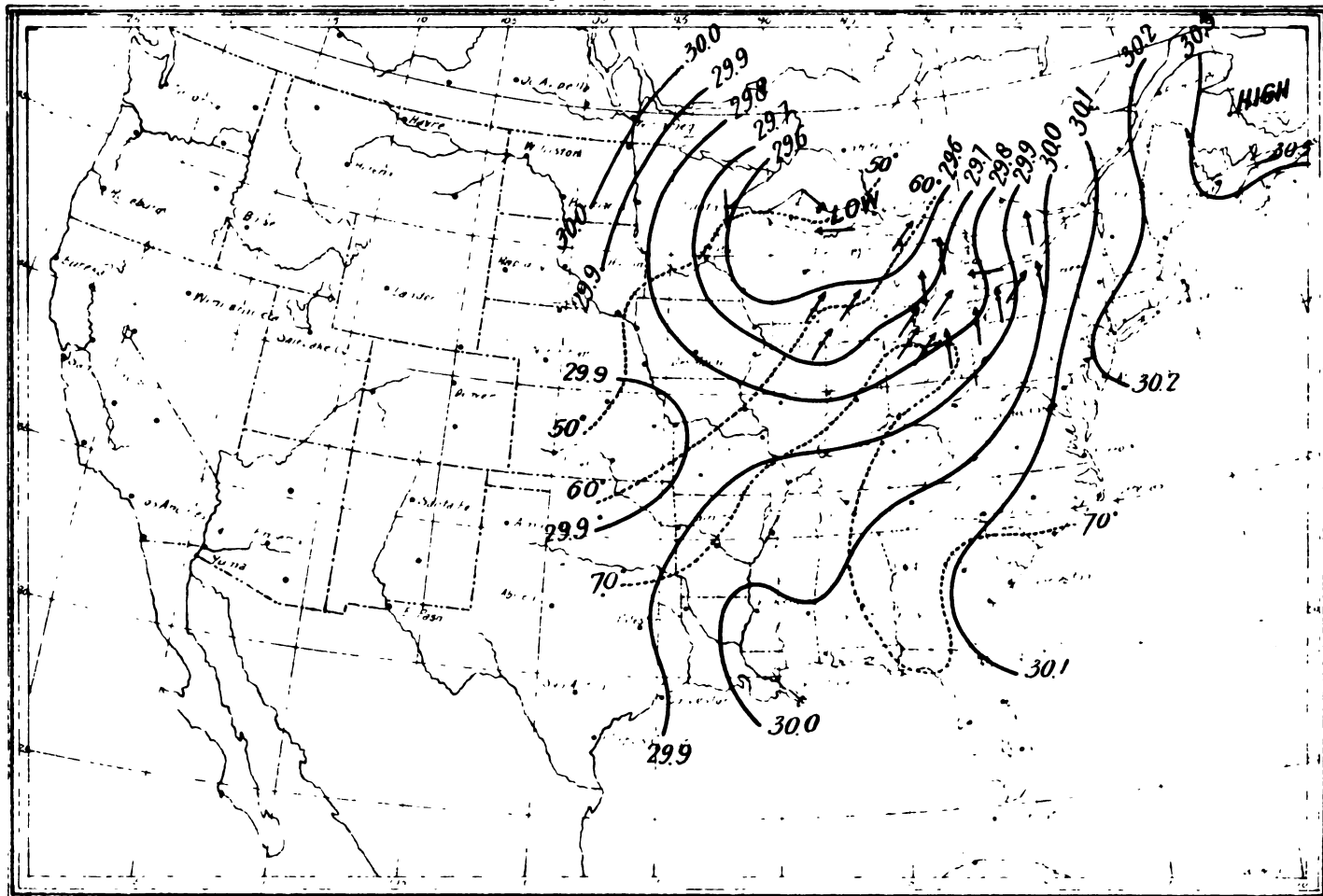


Chart CXXOVI.

May 20, 1878—4:35 p. m.

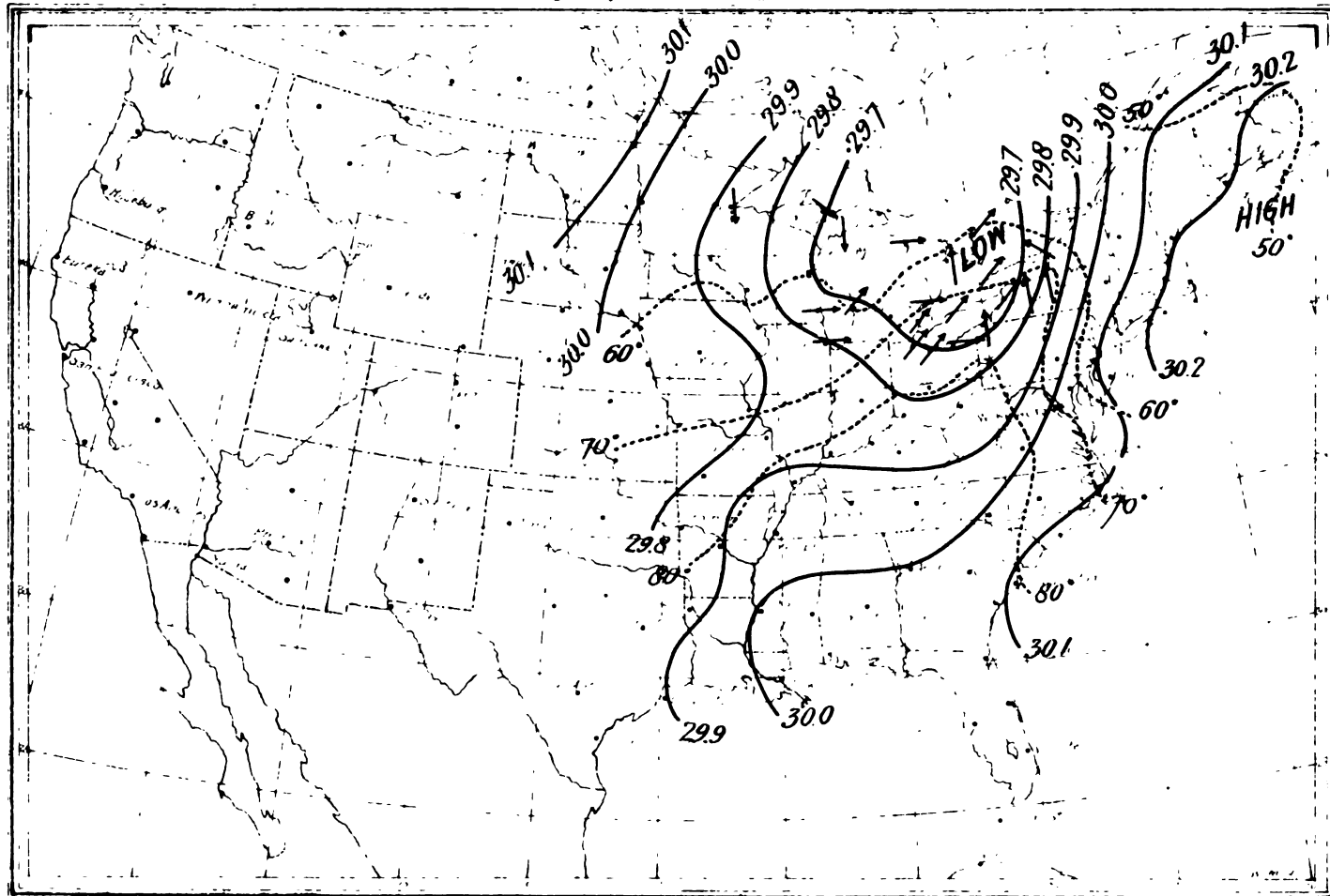


Chart CXXOVII.

May 1, 1894—7 a. m.

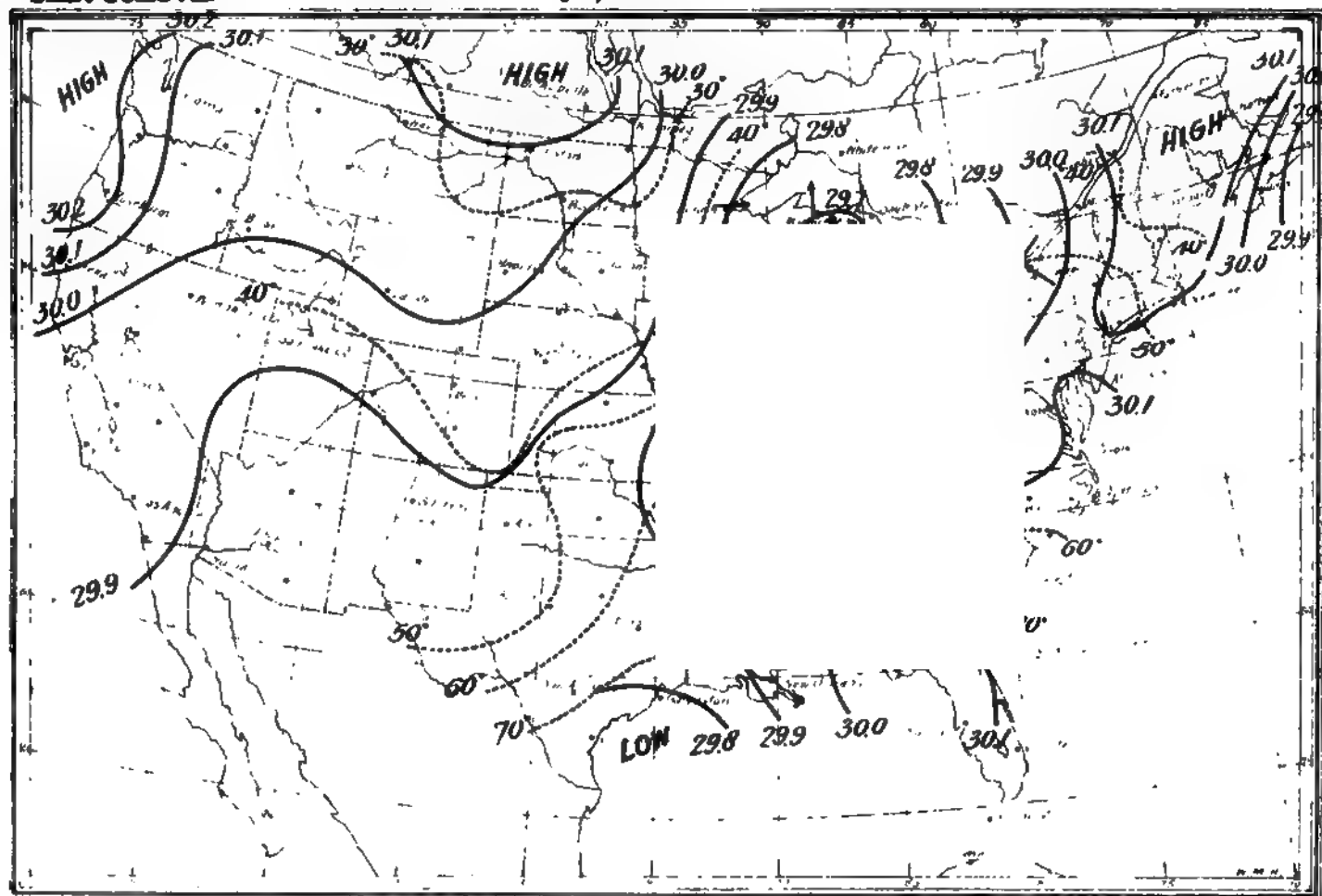


Chart CXXOVIII.

May 1, 1894—8 p. m.

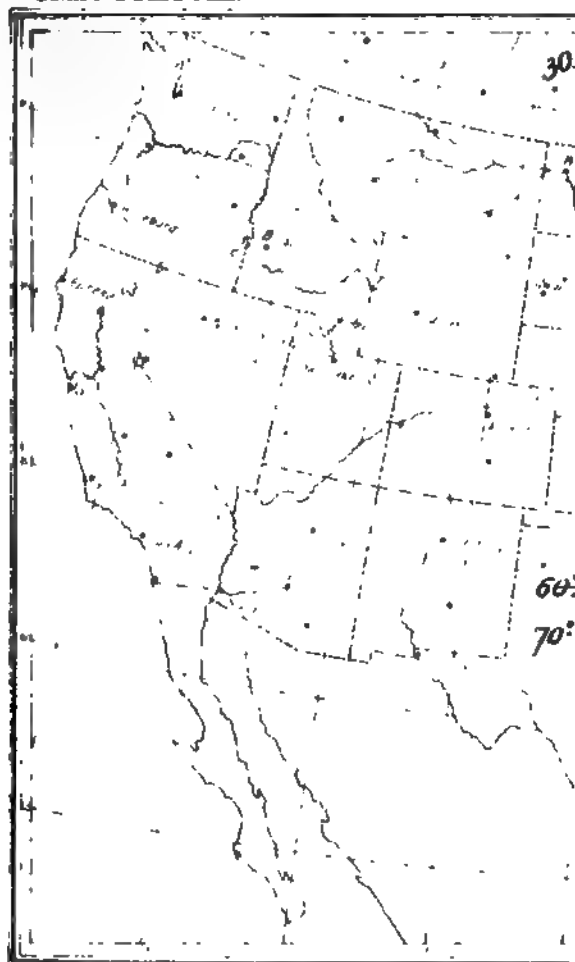


Chart CXXIX.

May 2, 1884—7 a. m.

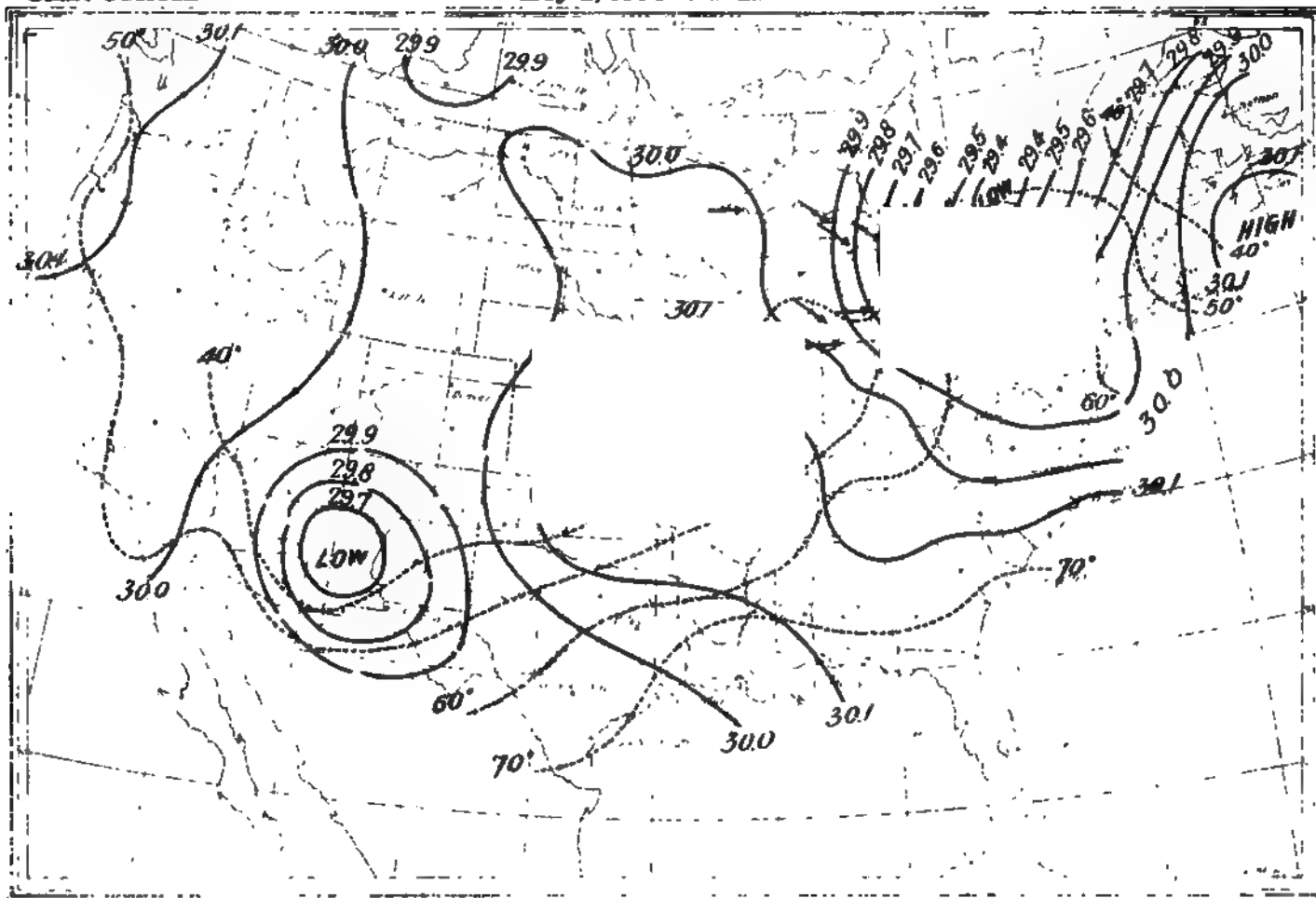


Chart CXX.

May 2, 1884—3 p. m.

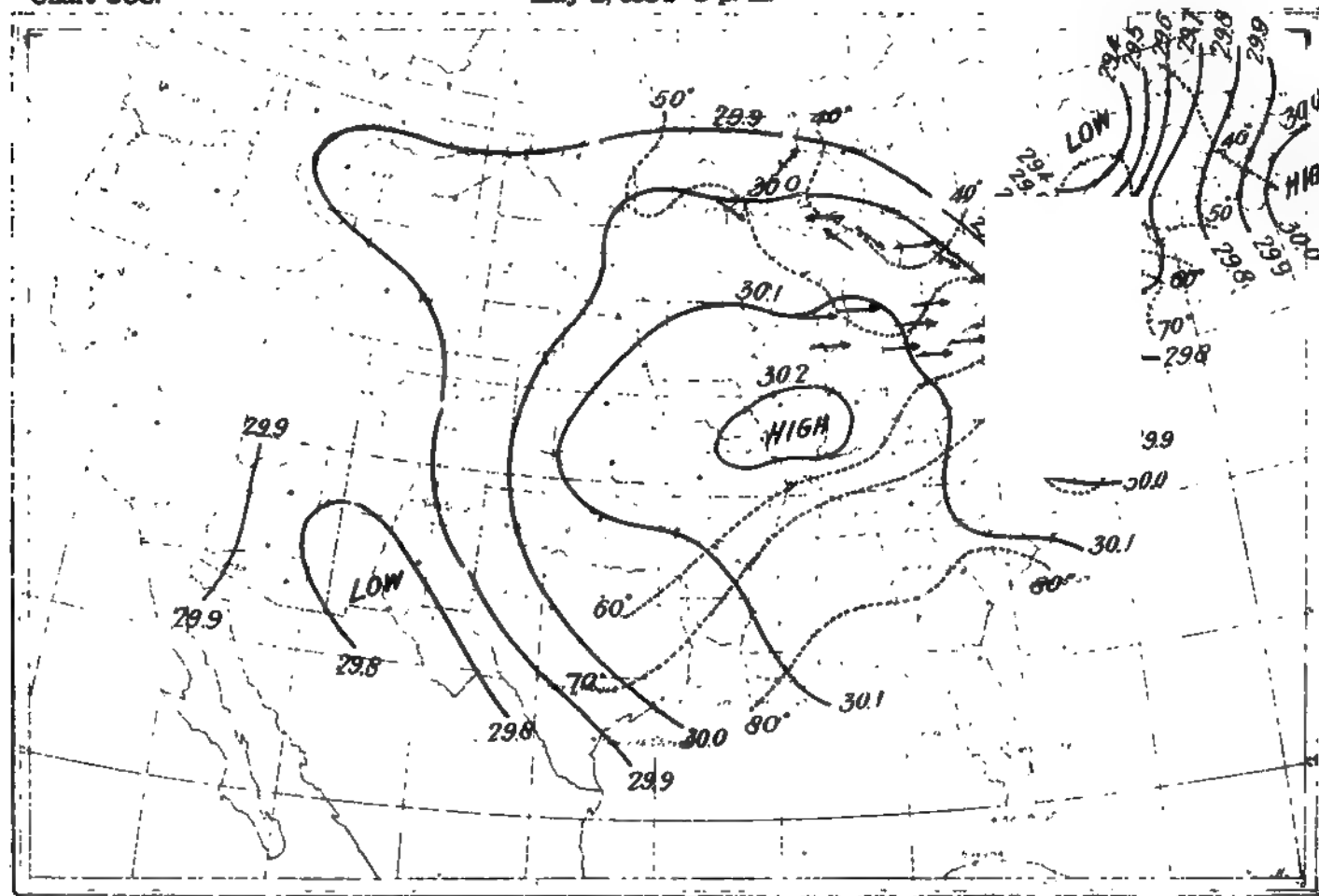


Chart 0001.

May 1, 1887-7 a. m.

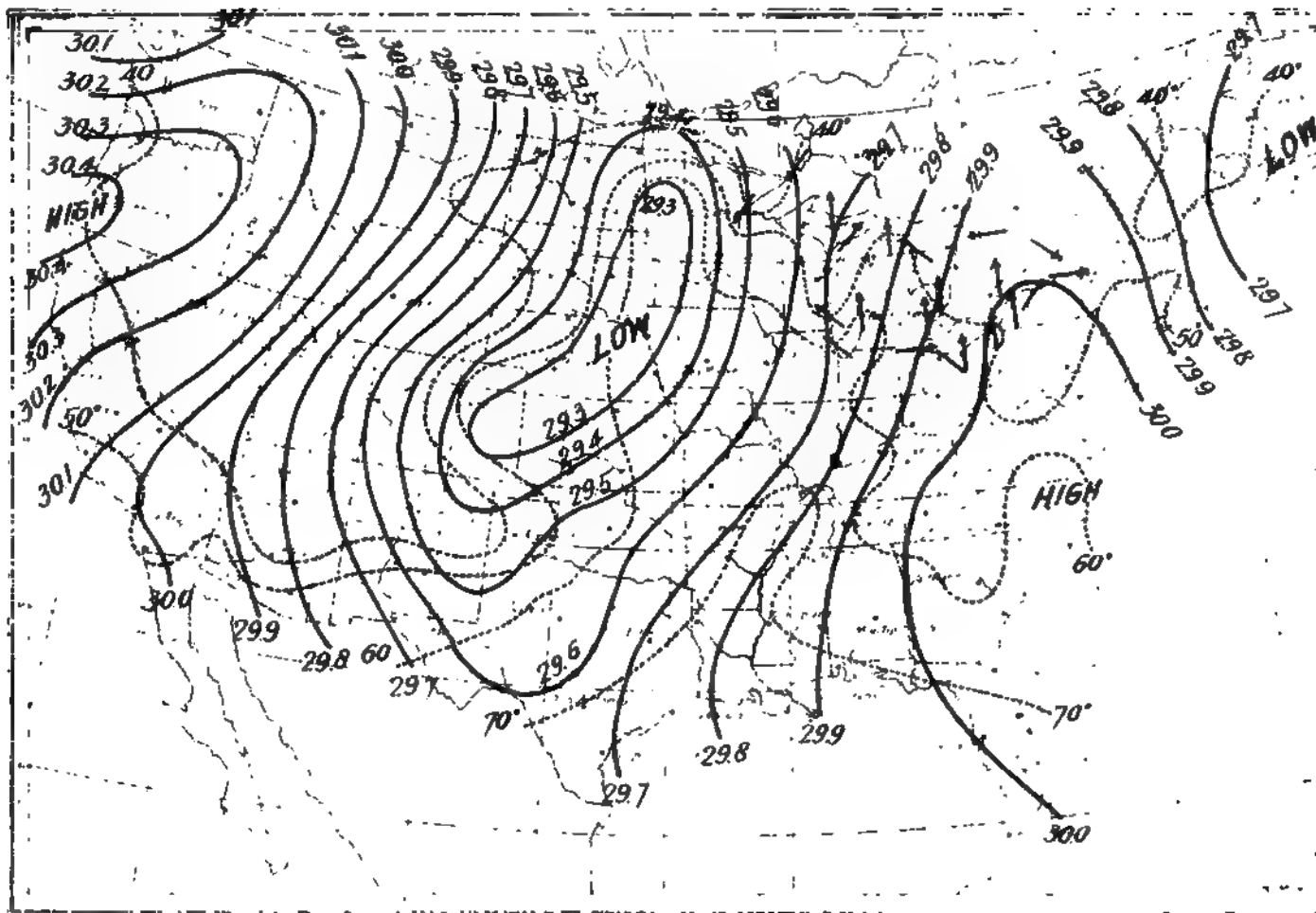


Chart 0001.

May 1, 1887-8 p. m.

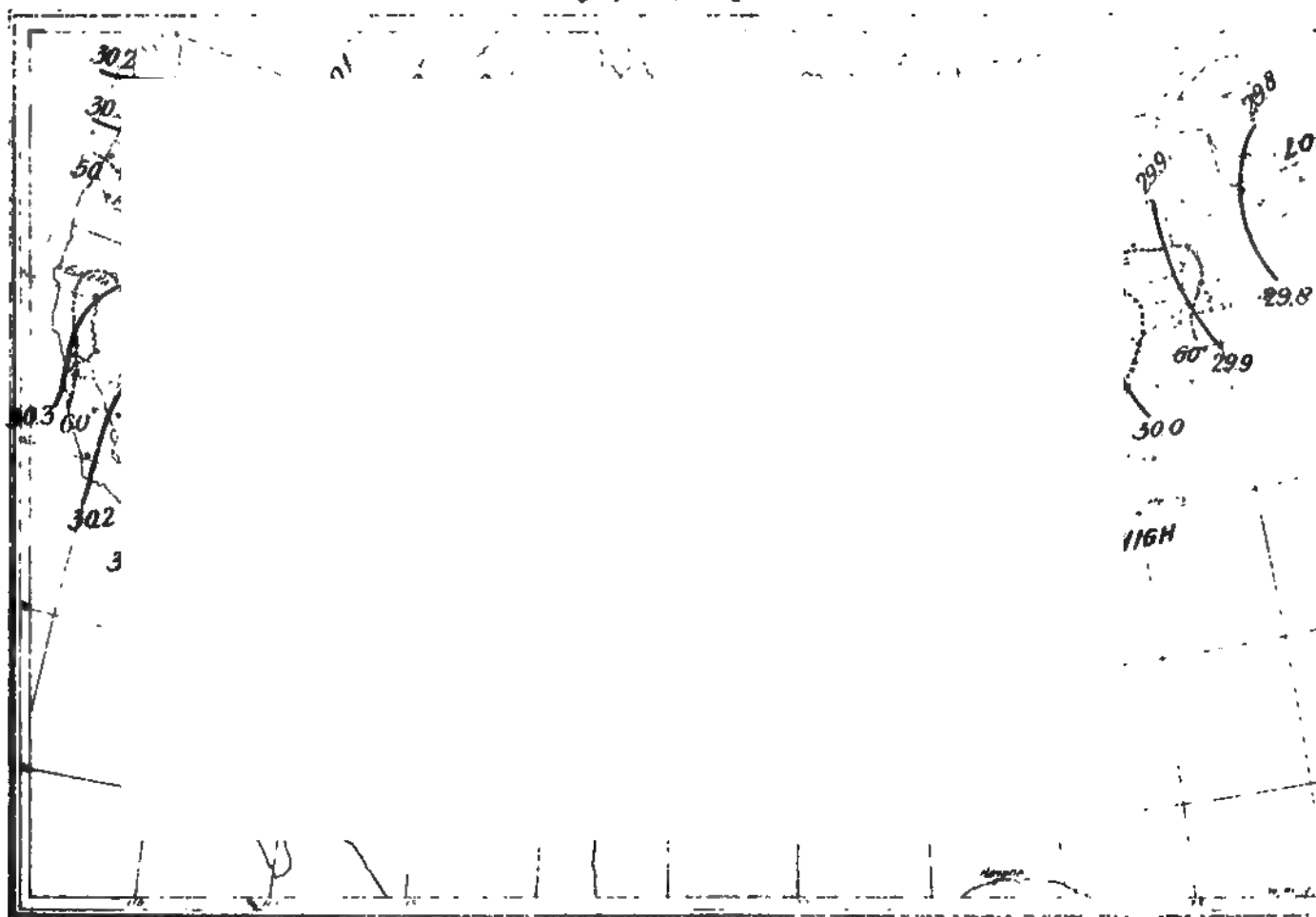


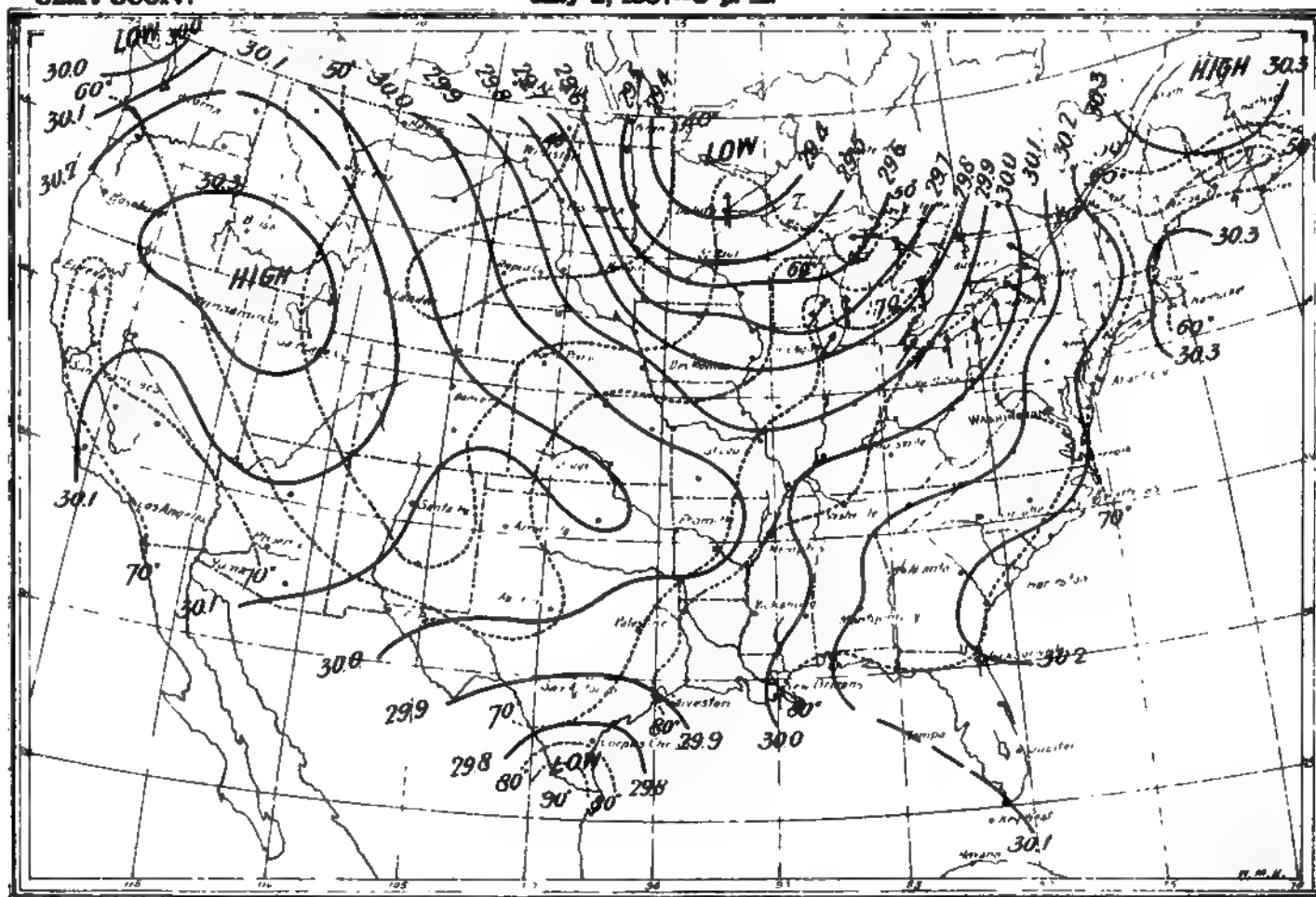
Chart 000III.

May 2, 1887—7 a. m.



Chart 000IV.

May 2, 1887—3 p. m.



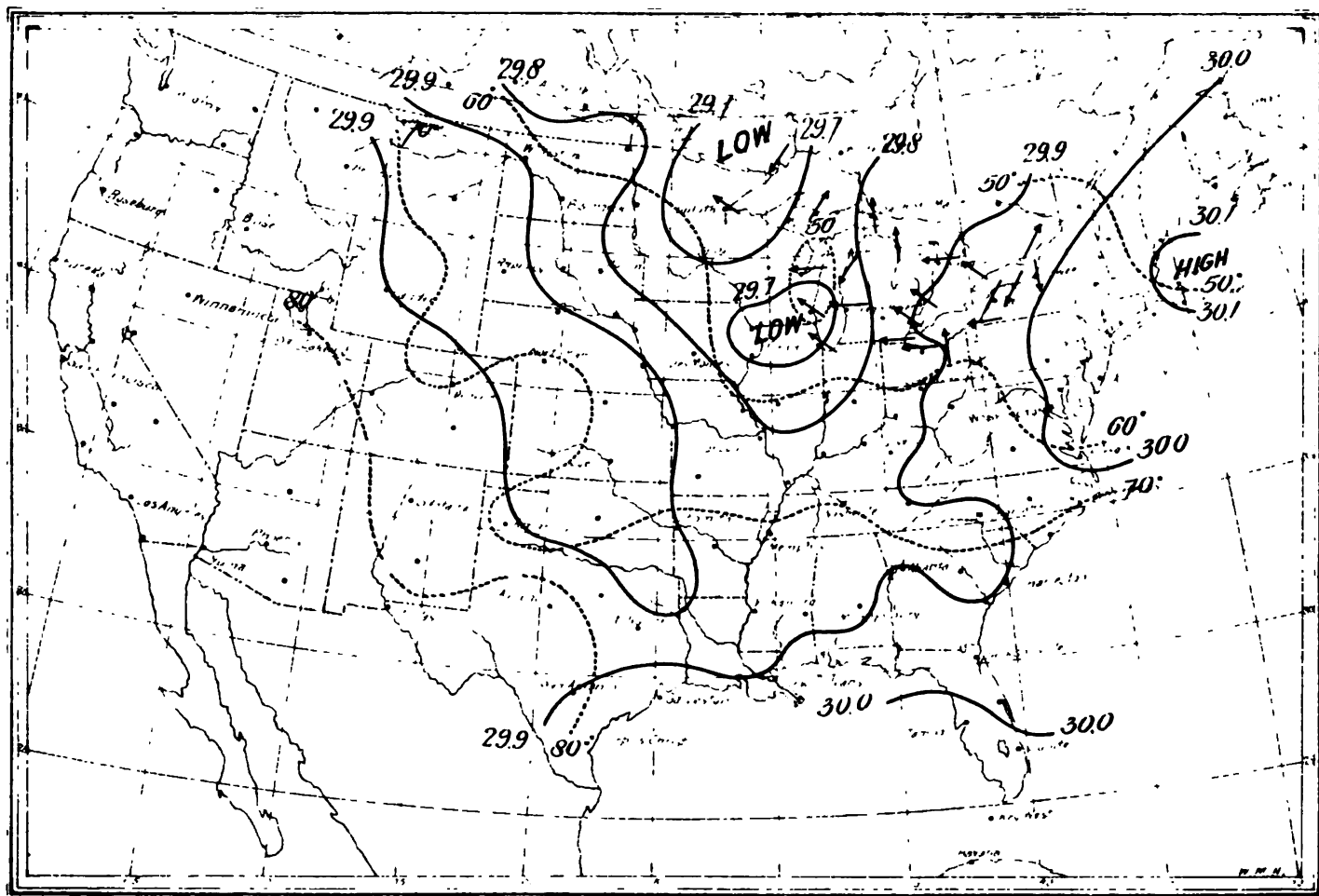
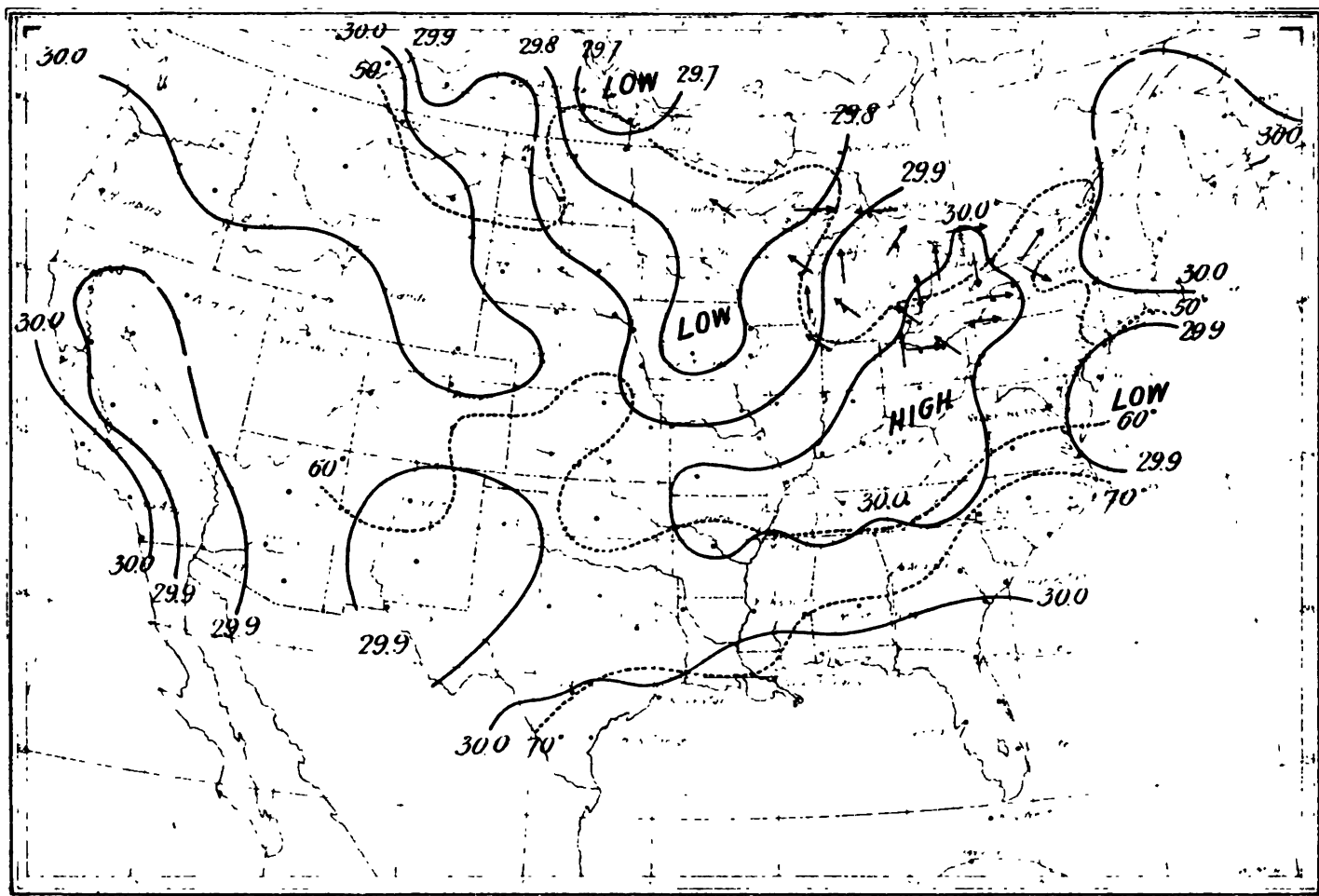


Chart COOVII.

May 27, 1889—8 a. m.

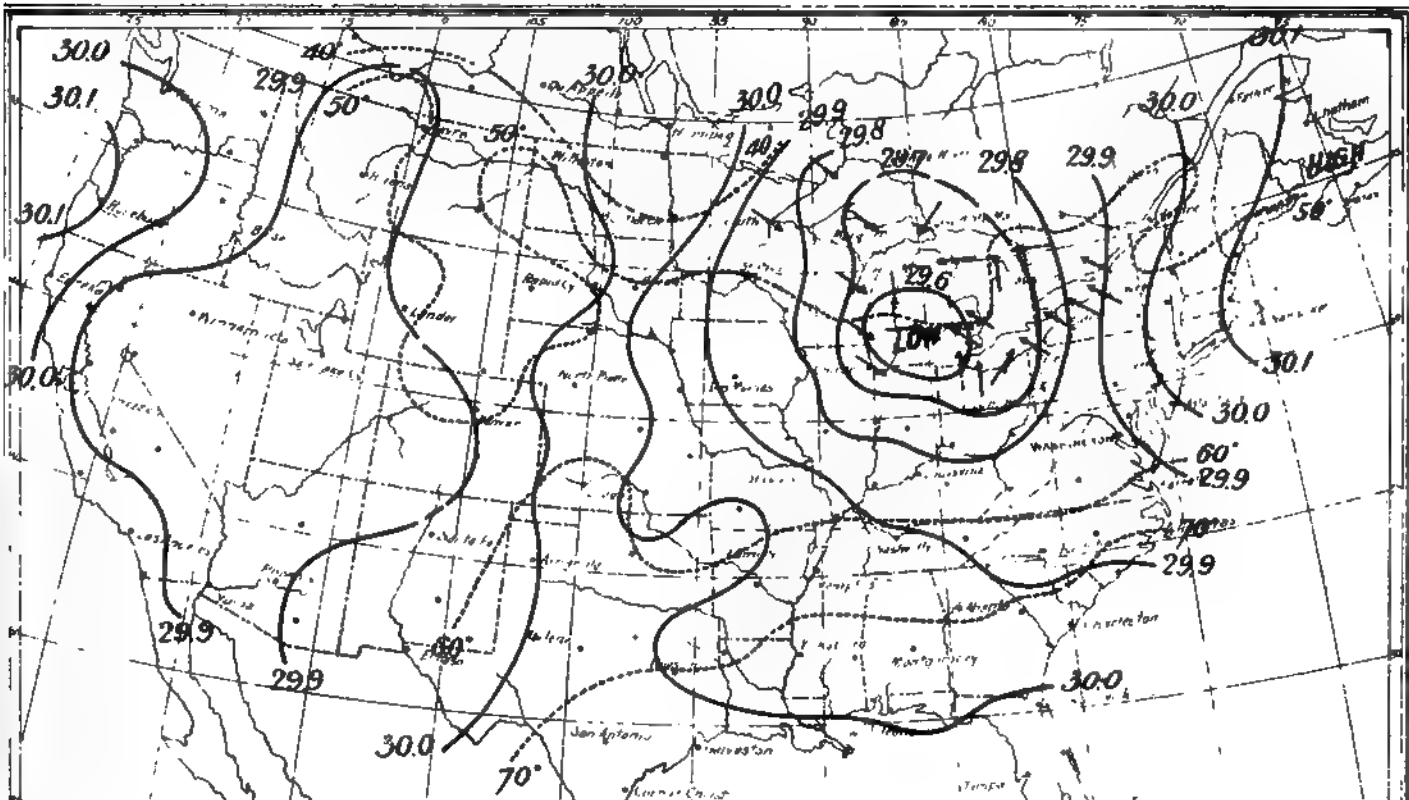


Chart COOVIII.

May 27, 1889—8 p. m.

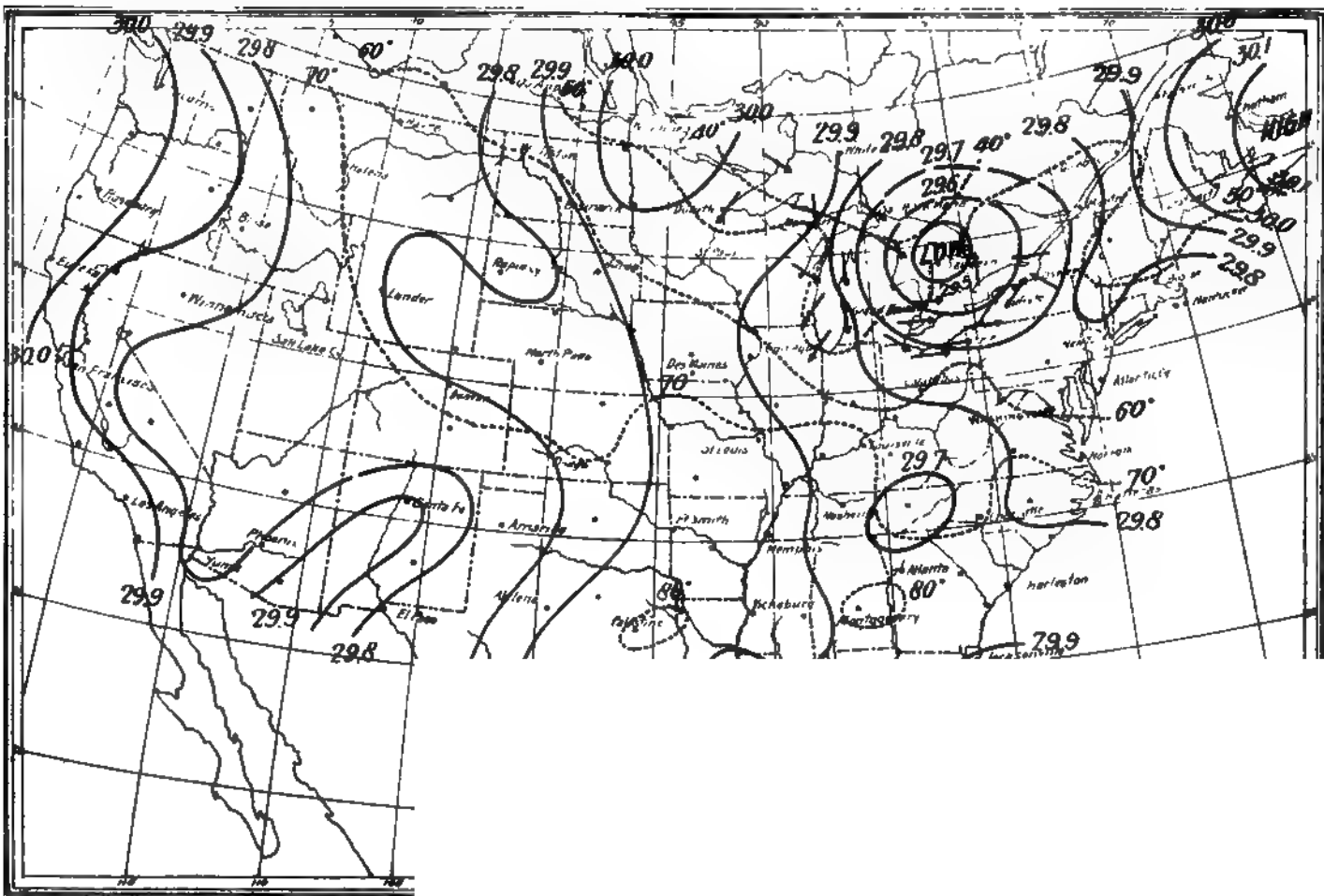


Chart 0001X

May 9, 1890—8 a. m.

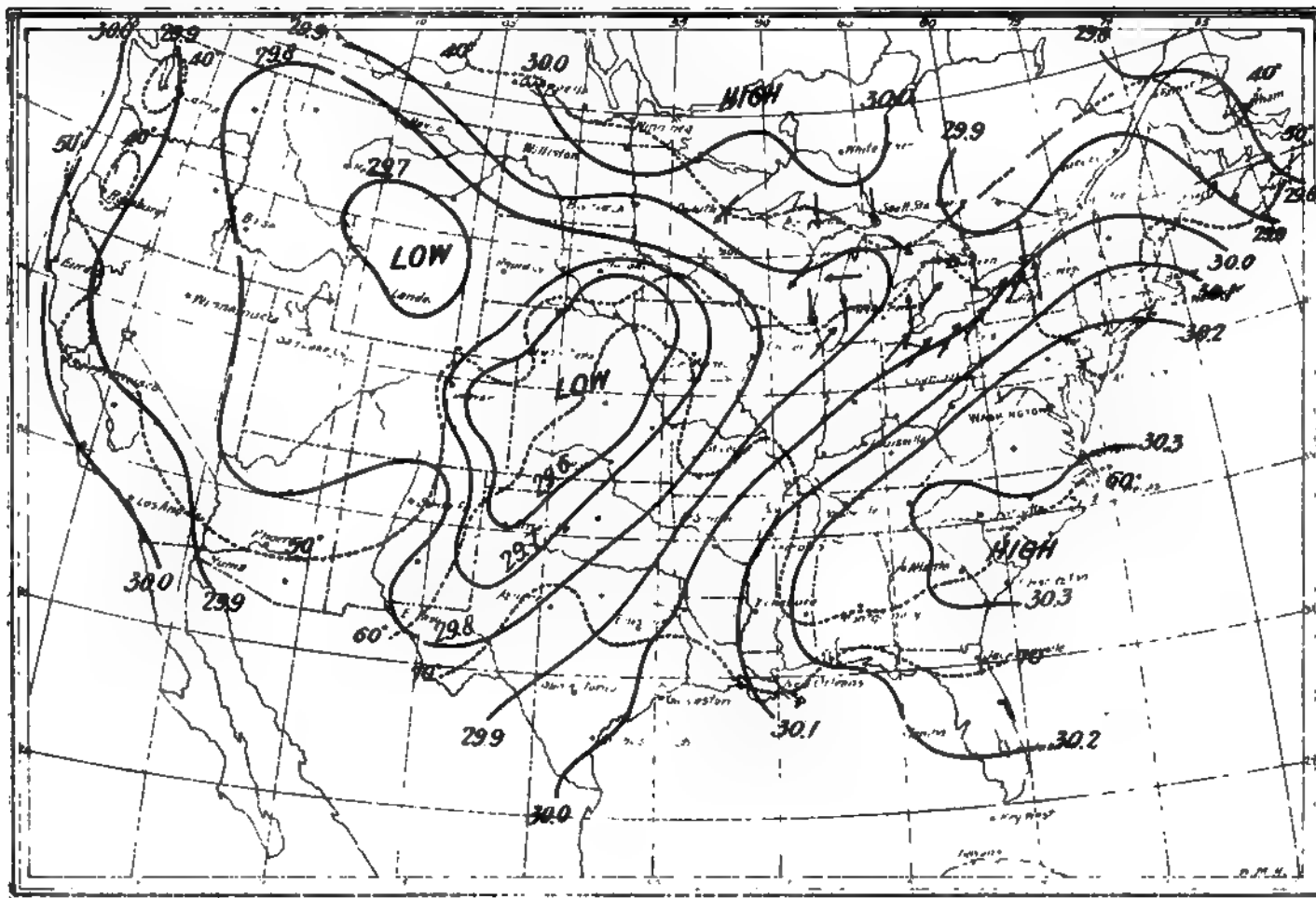


Chart 0001X

May 9, 1890—8 p. m.

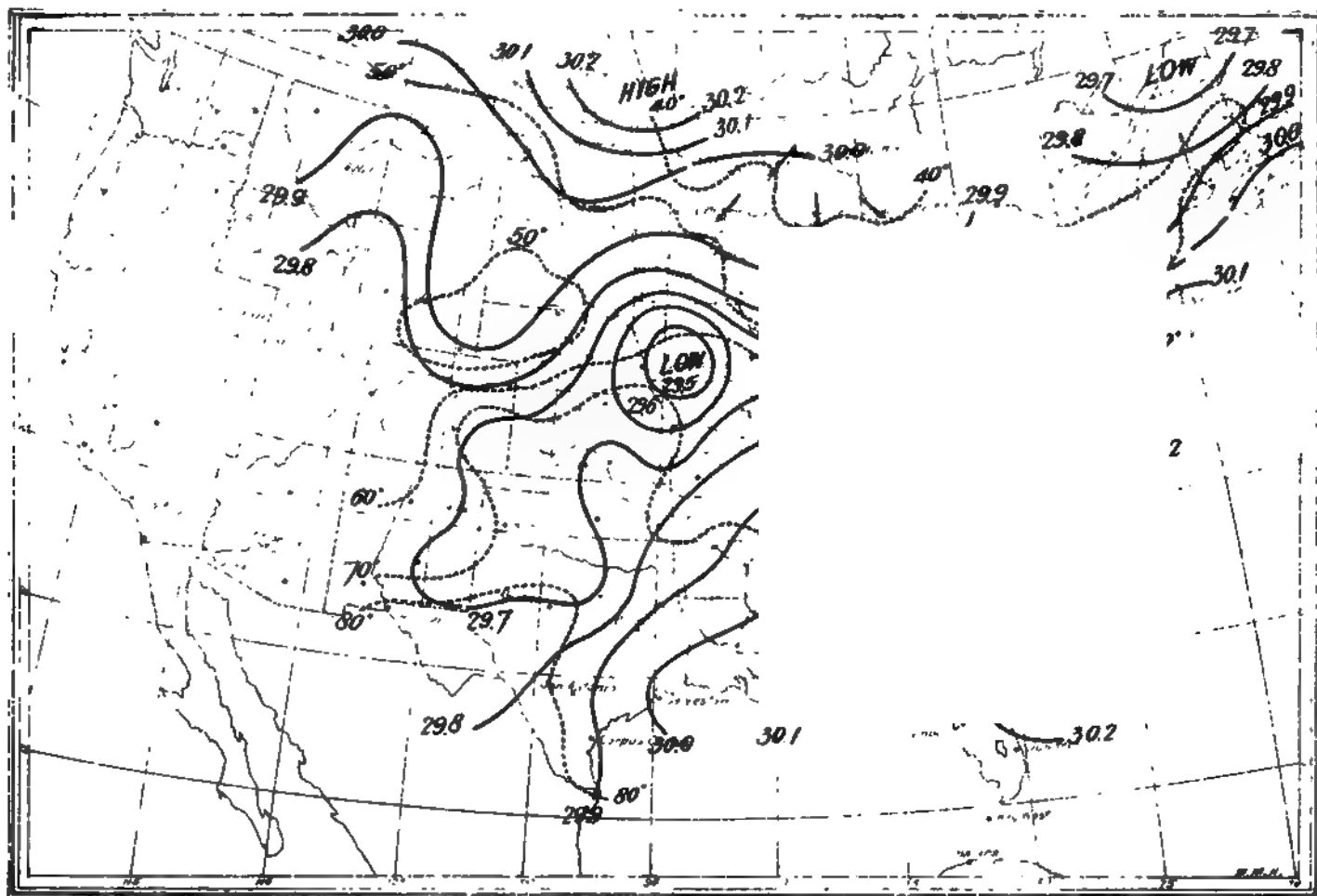


Chart 000XI.

May 10, 1890—8 a. m.

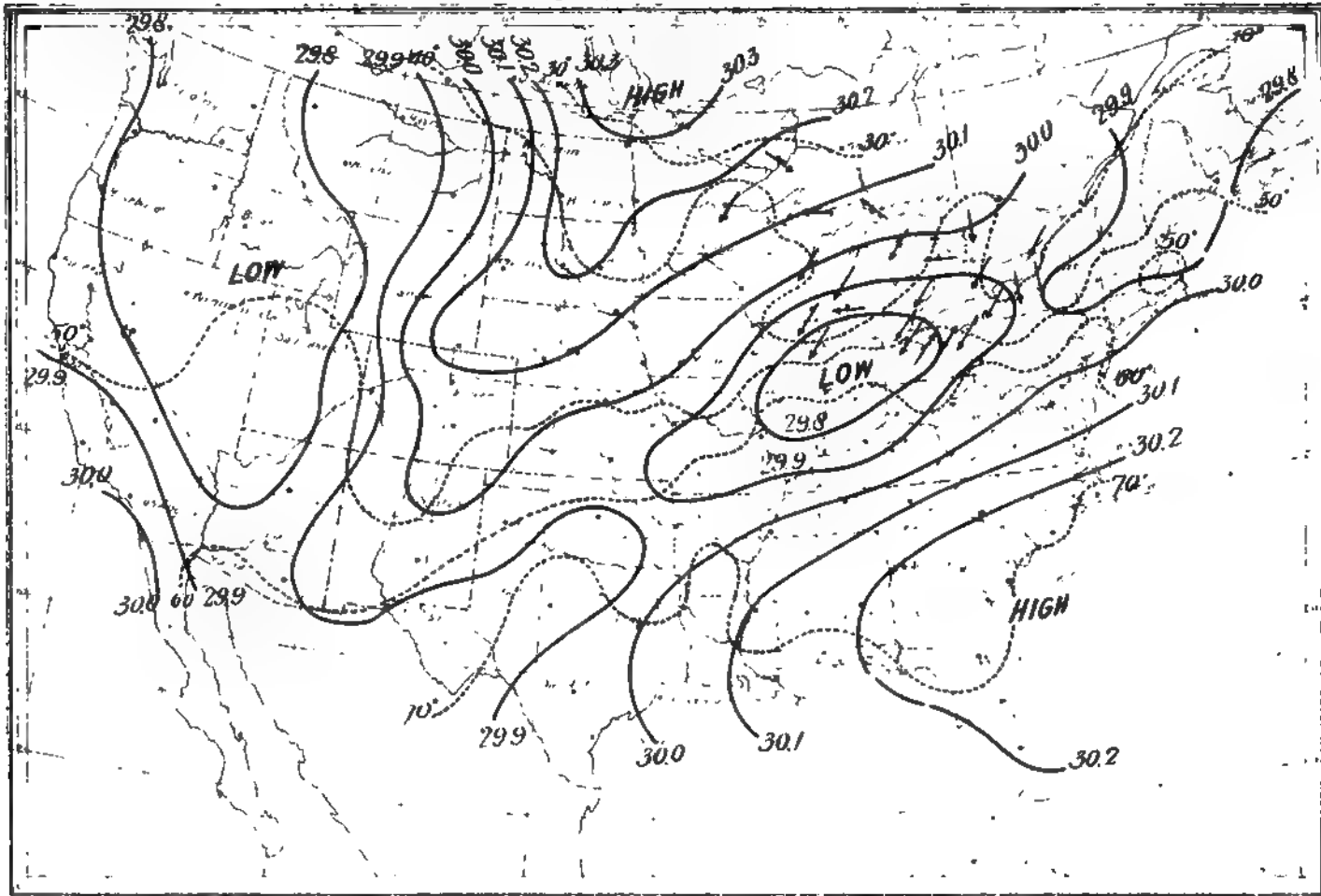


Chart 000XII.

May 10, 1890—8 p. m.

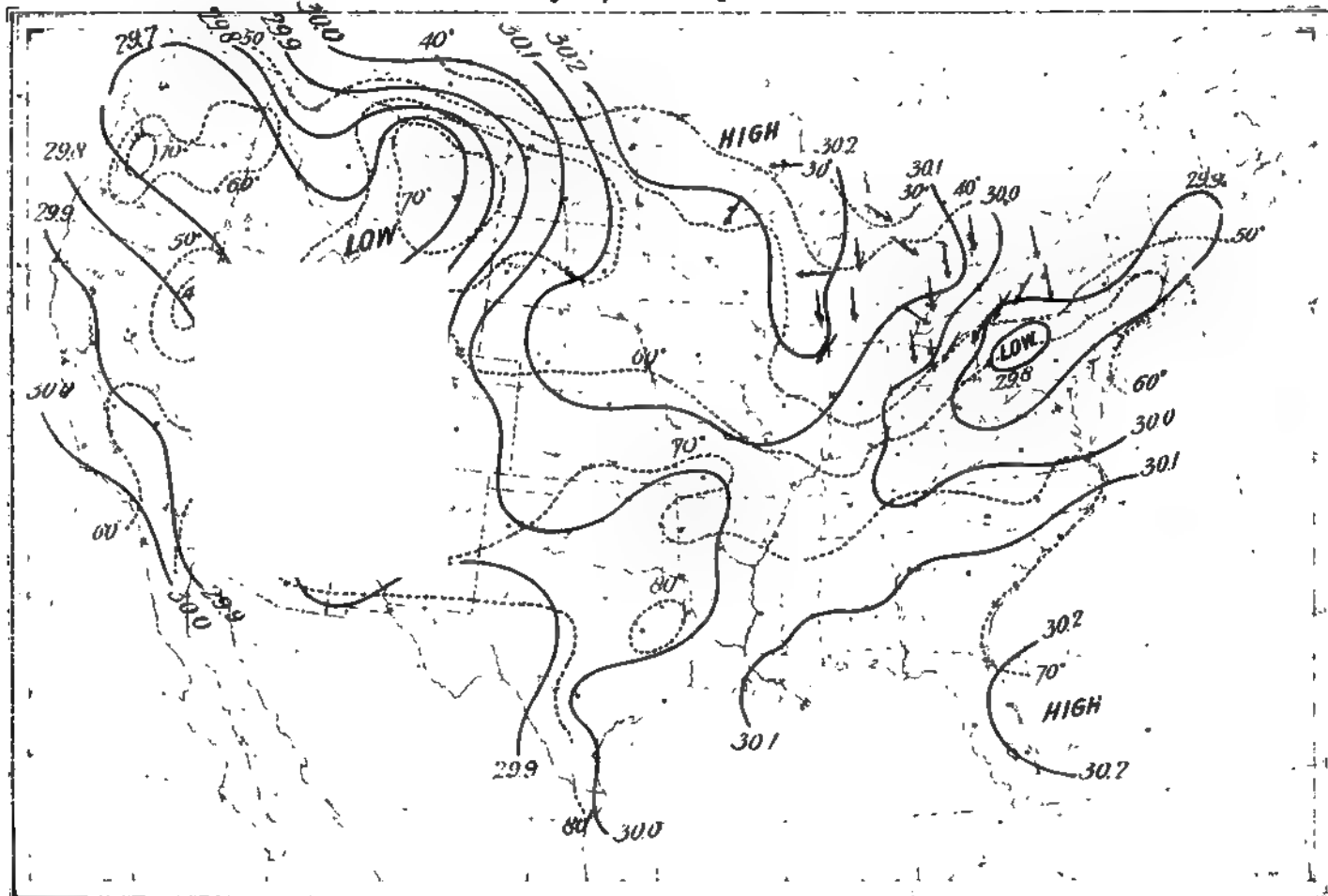


Chart CCOXIII.

May 15, 1890—8 a. m.

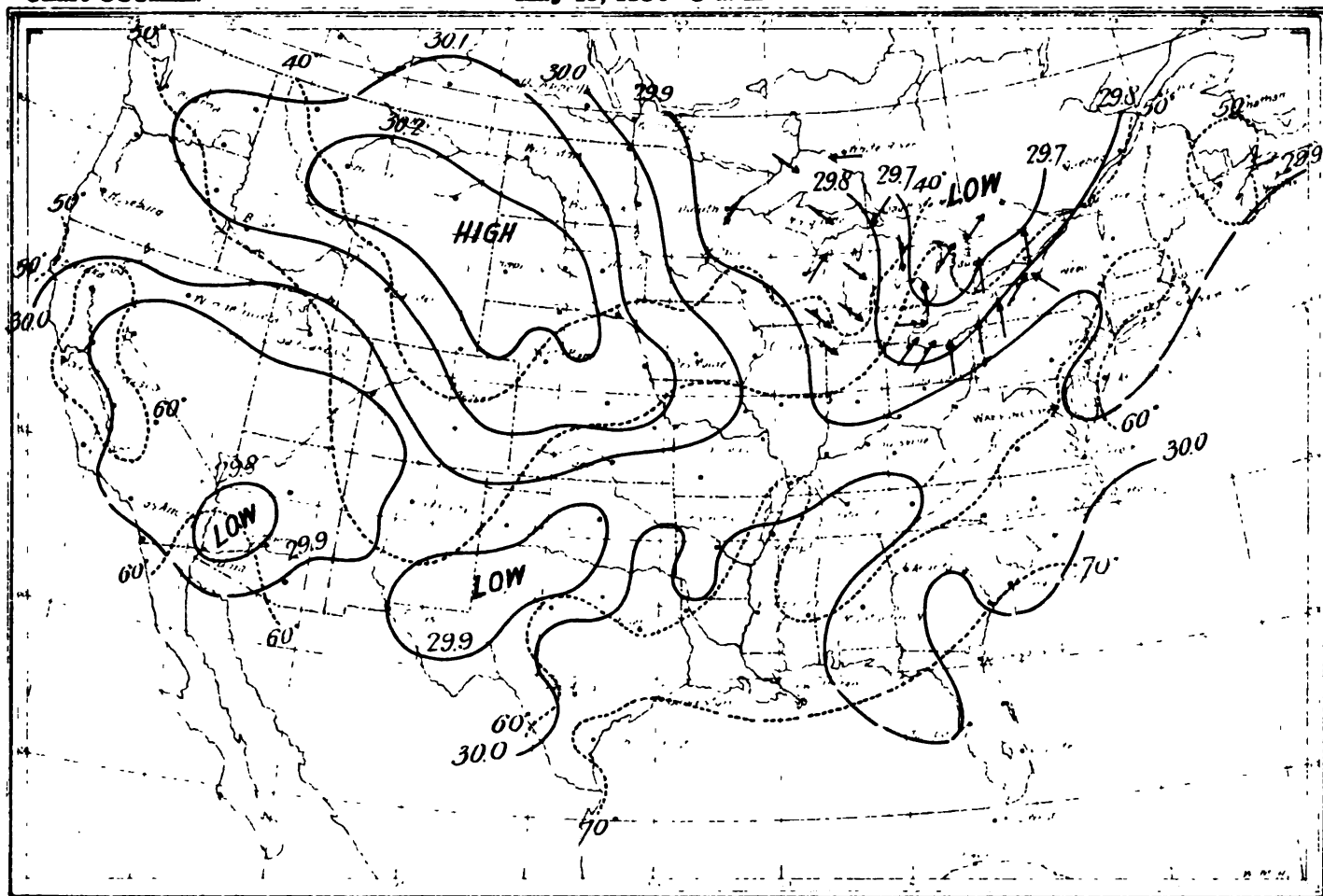


Chart CCOXIV.

May 15, 1890—8 p. m.

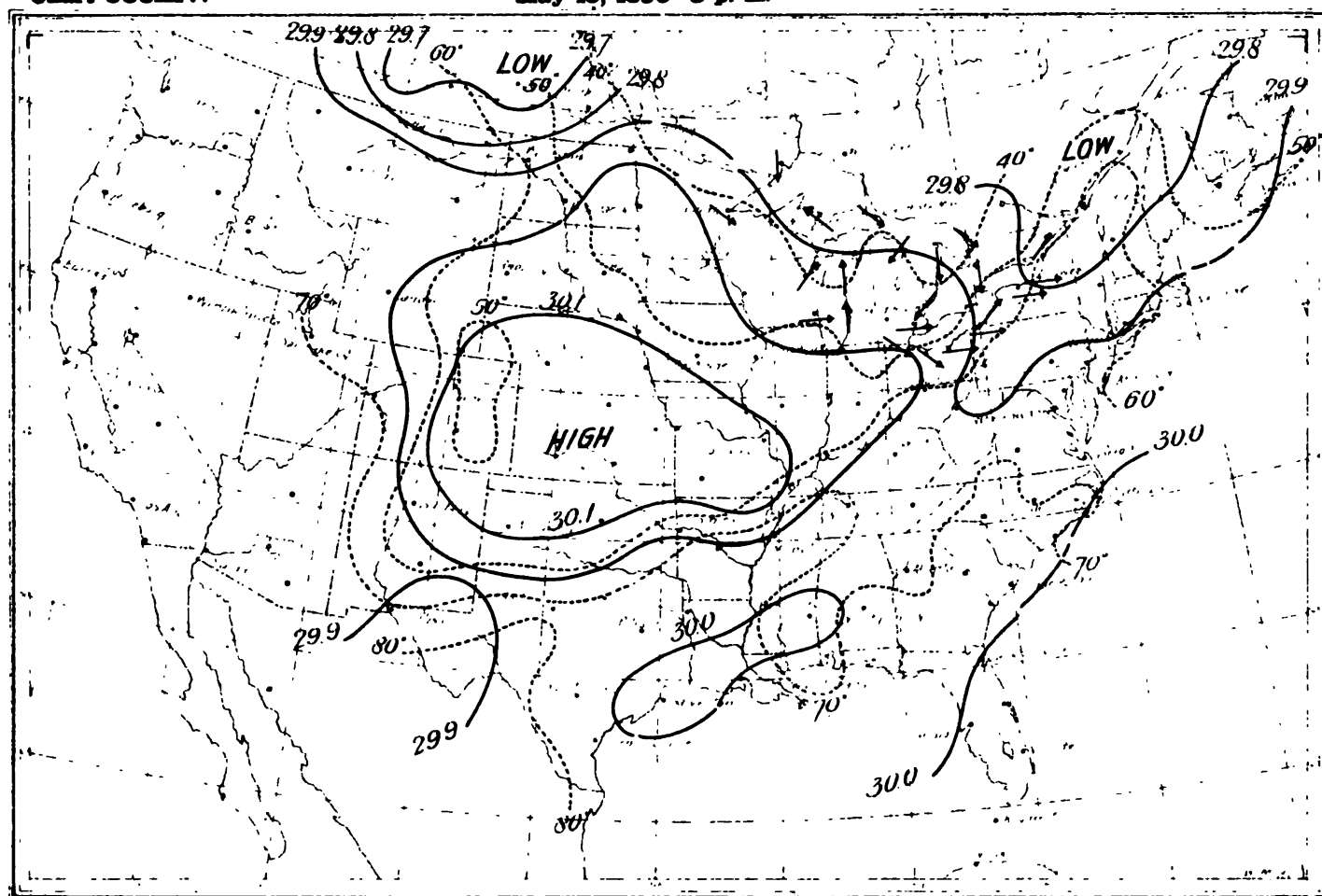


Chart CCOXV.

May 16, 1890—8 a. m.

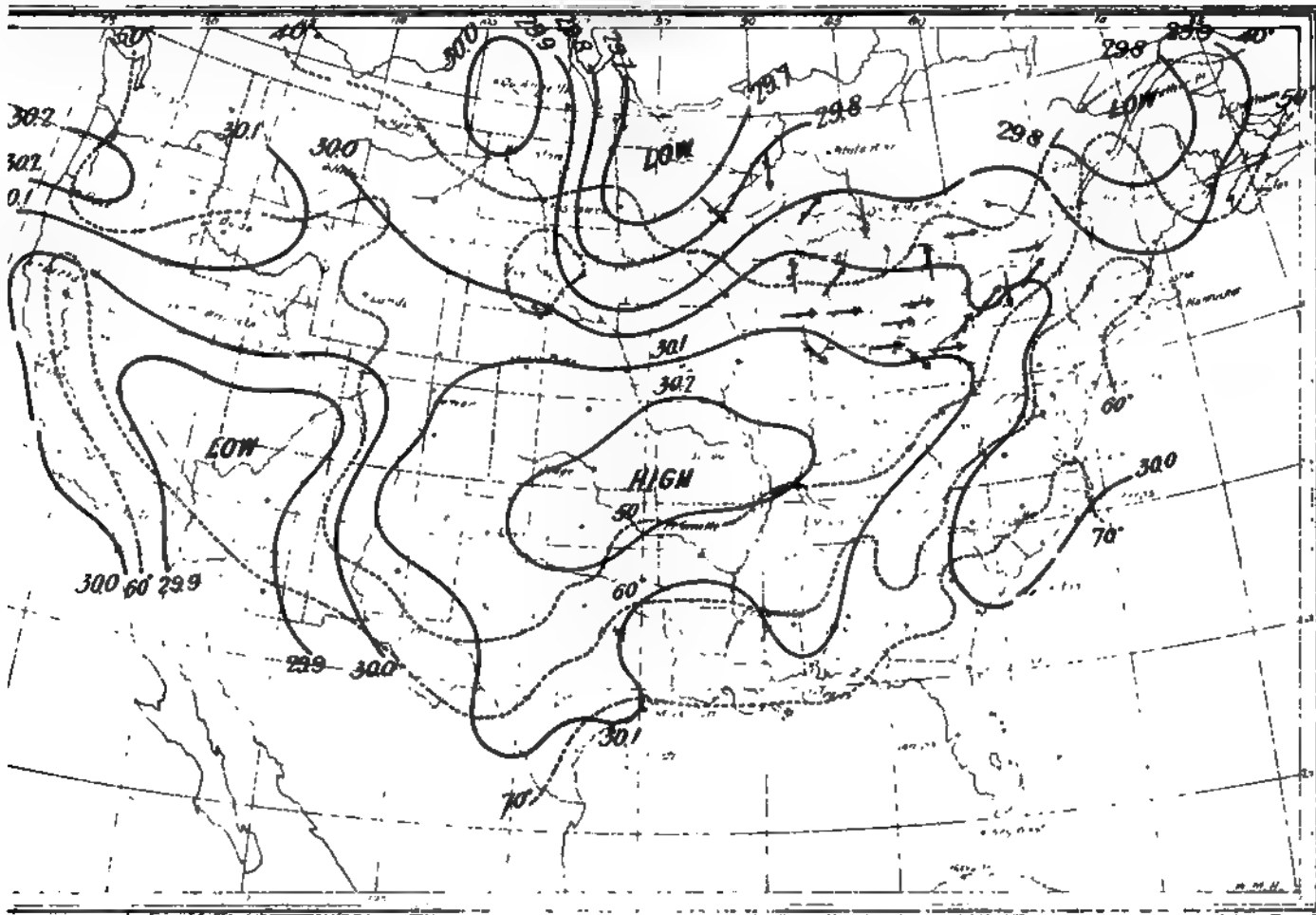


Chart CCOXVI.

May 16, 1890—8 p. m.

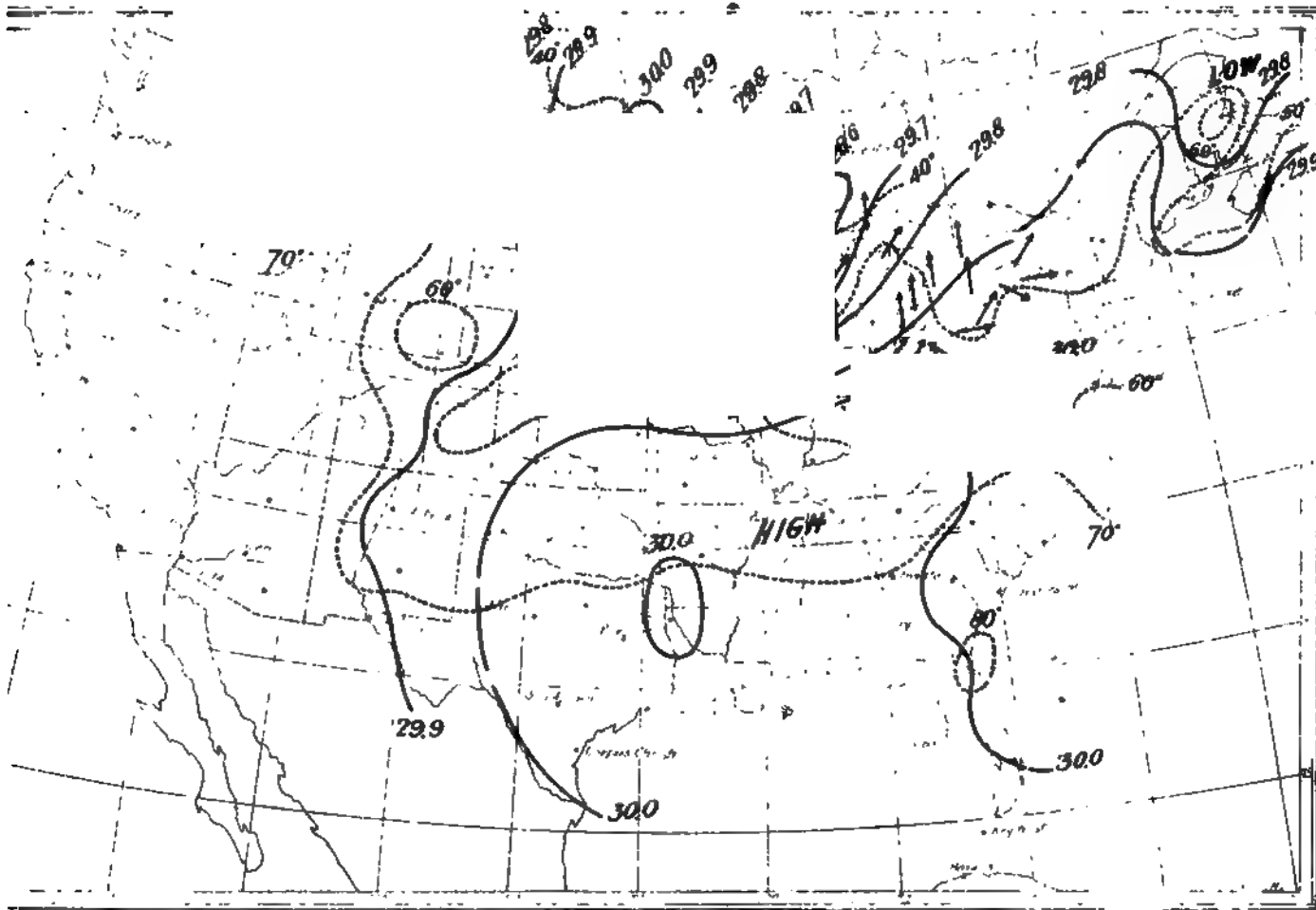


Chart COOXVII.

May 2, 1892—8 a. m.

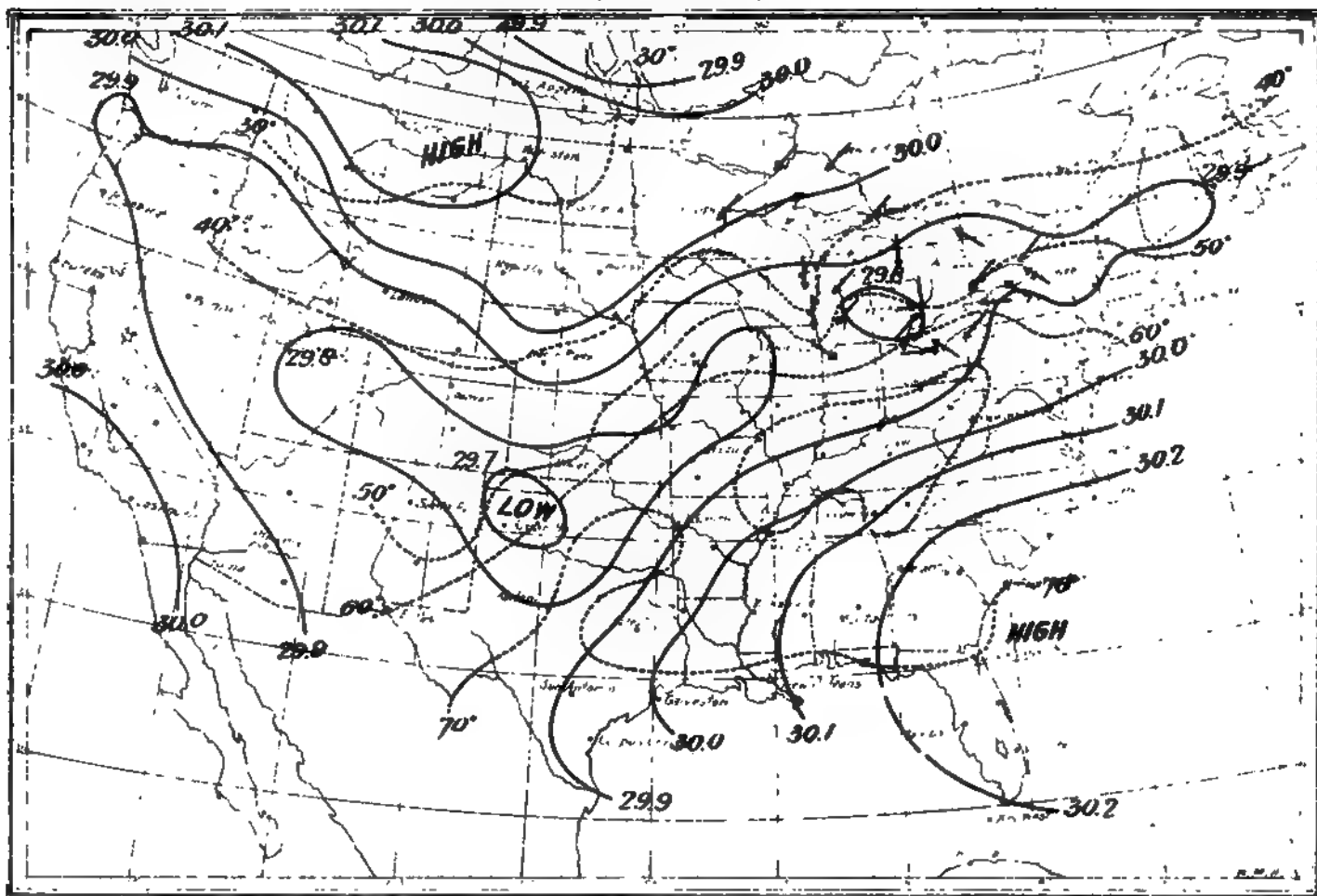


Chart COOXVIII.

May 2, 1892—8 p. m.

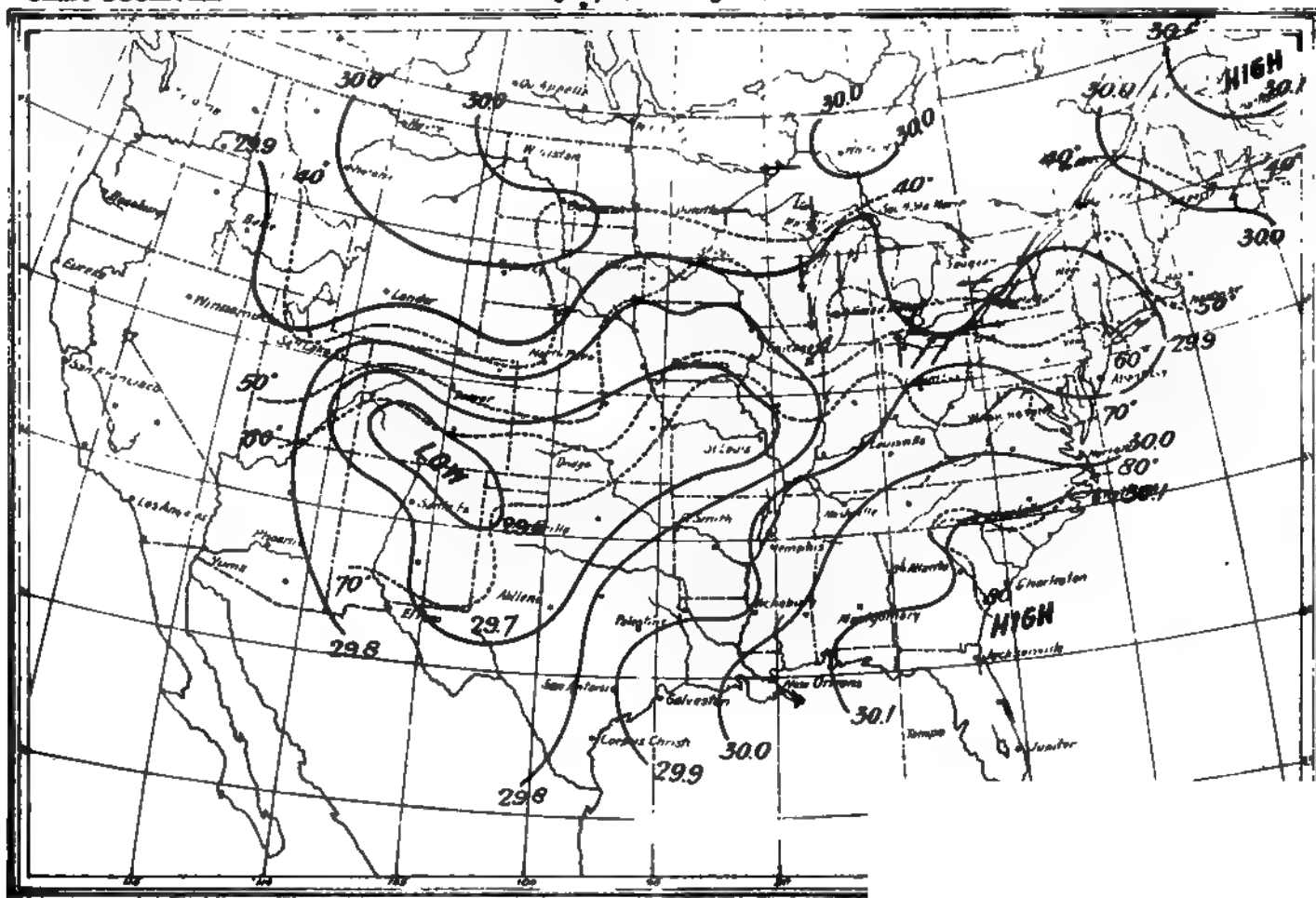


Chart CCOXIX.

May 3, 1892—8 a. m.

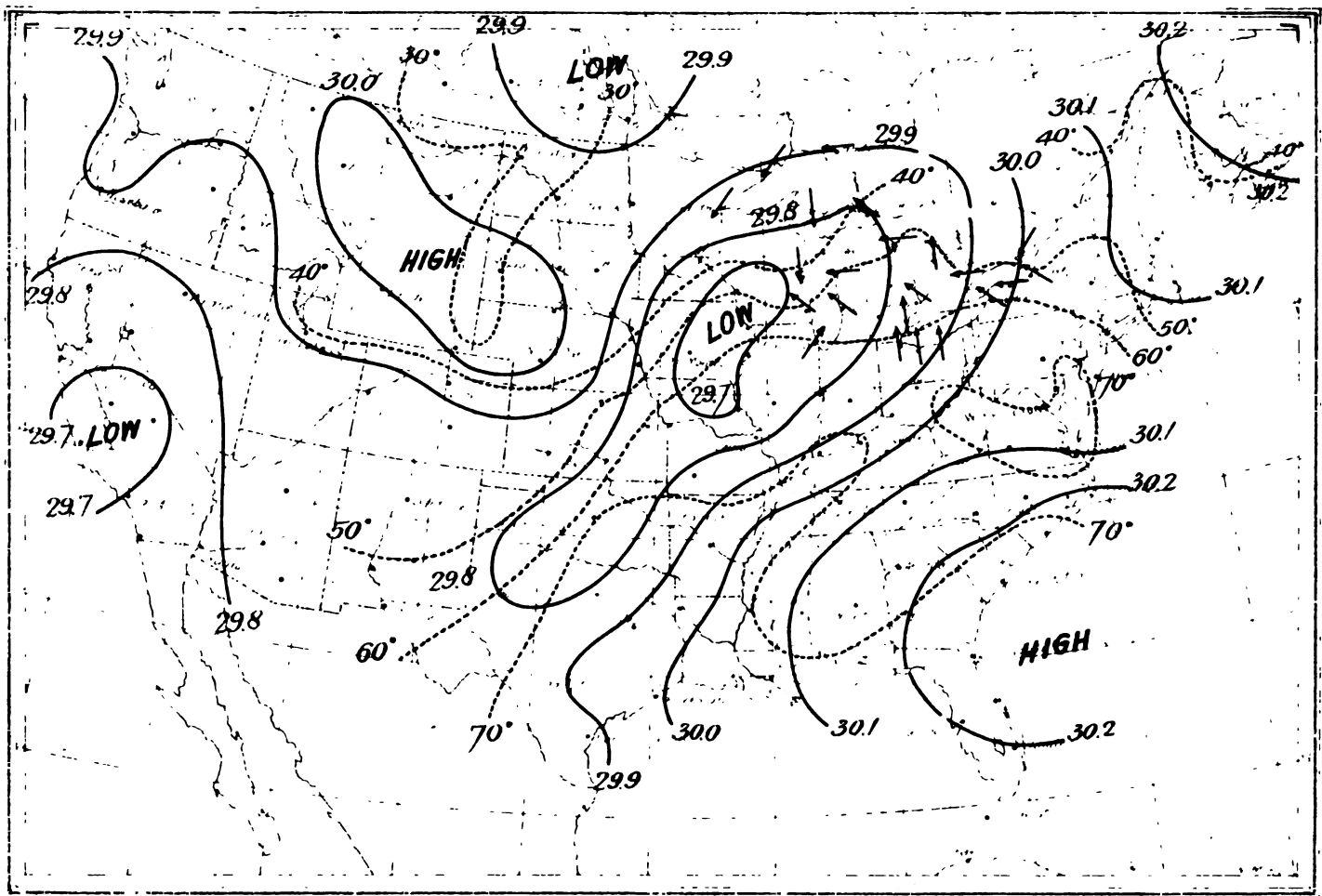


Chart CCOXX.

May 3, 1892—8 p. m.

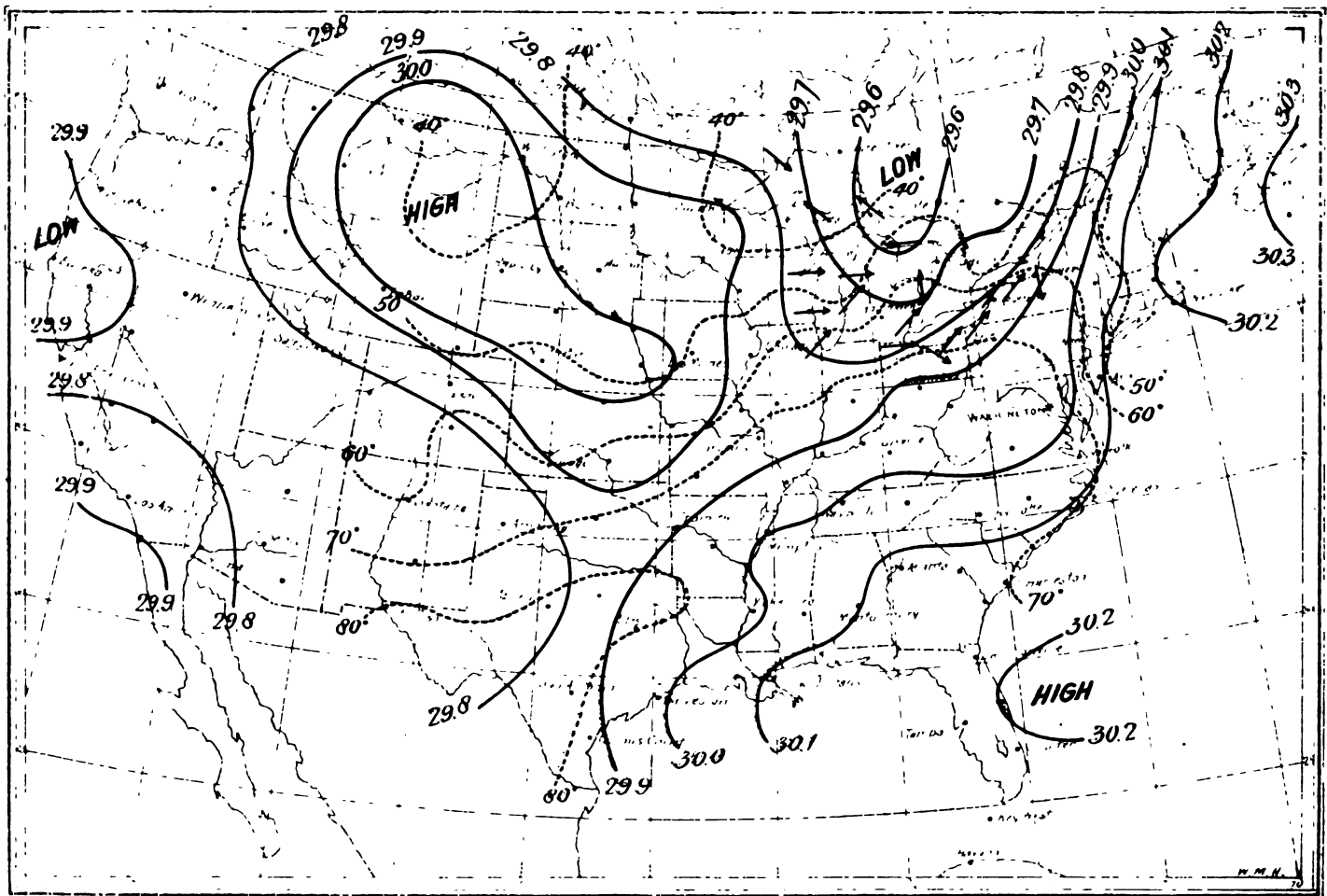


Chart CXXXI.

May 18, 1892—8 a. m.

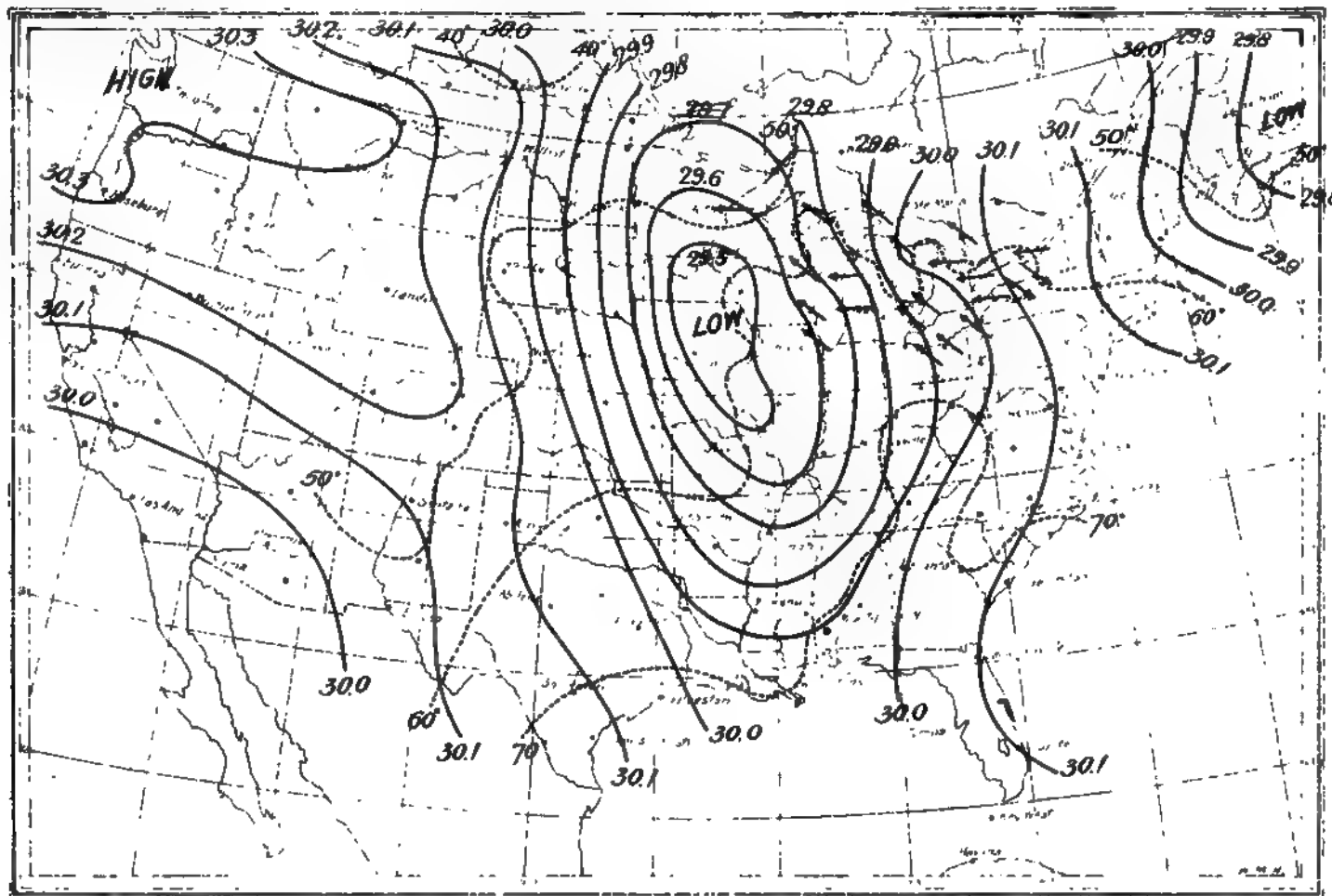


Chart CXXXII.

May 18, 1892—8 p. m.

Chart CCOXXIII.

May 19, 1892—8 a. m.

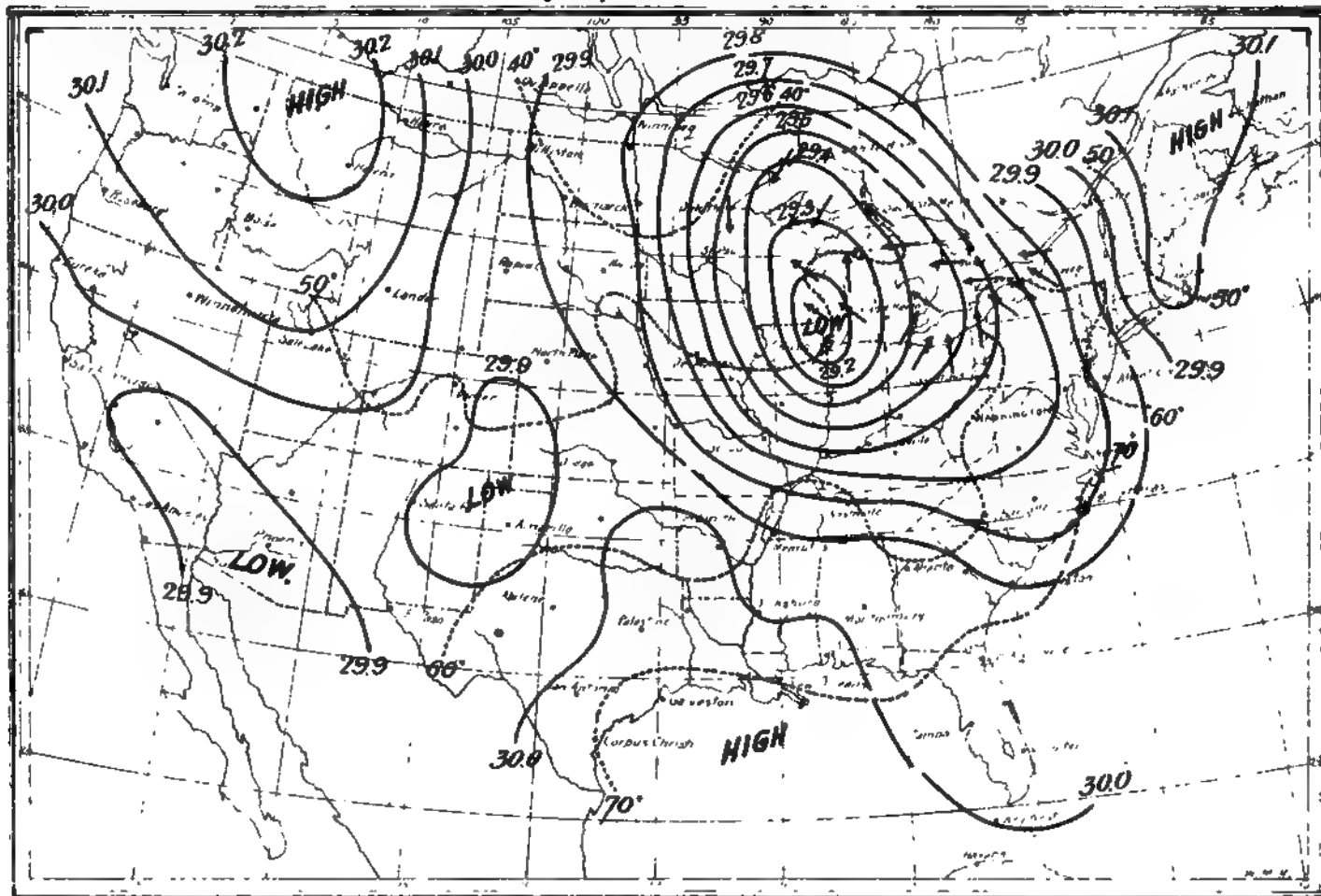
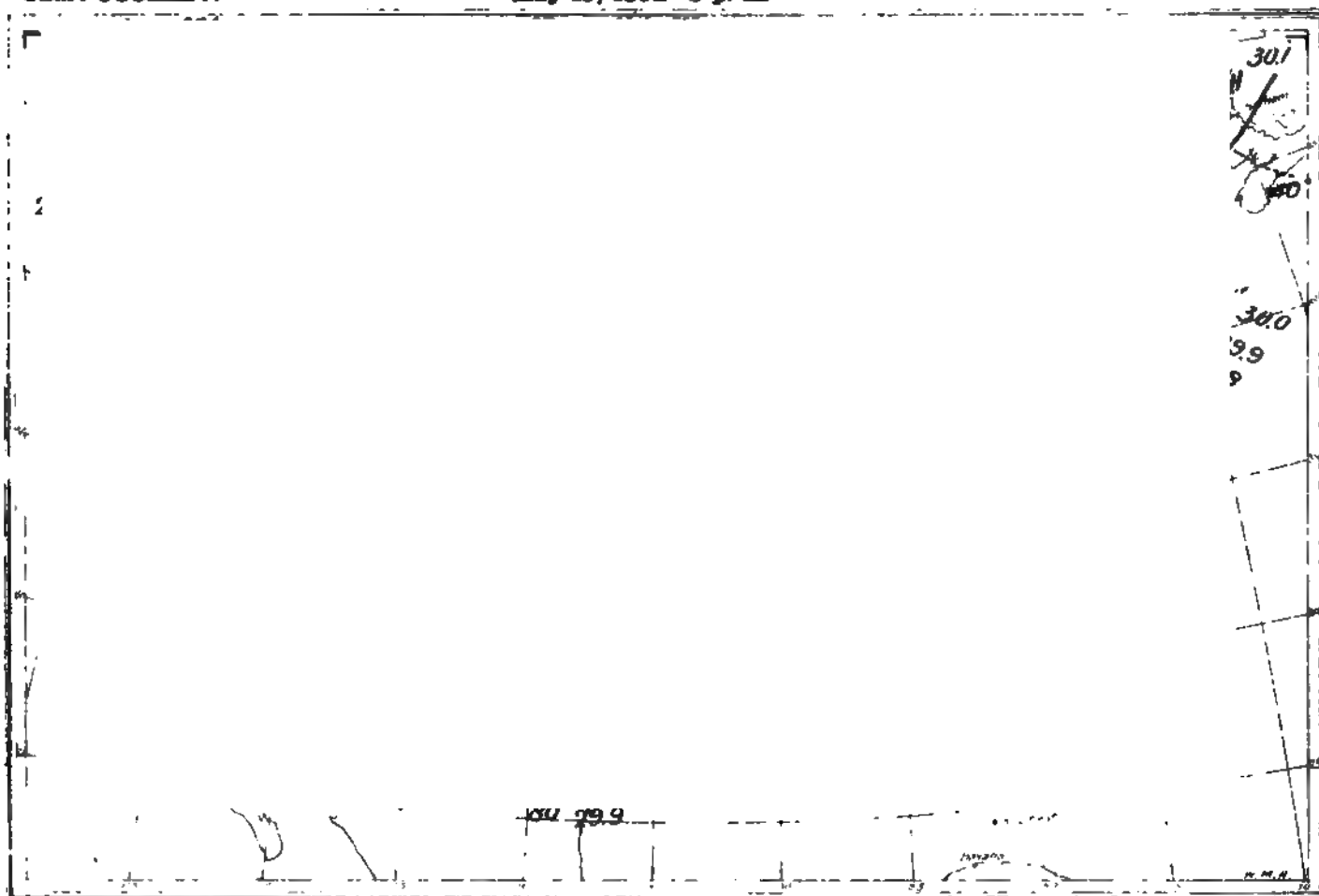


Chart CCOXXIV.

May 19, 1892—8 p. m.



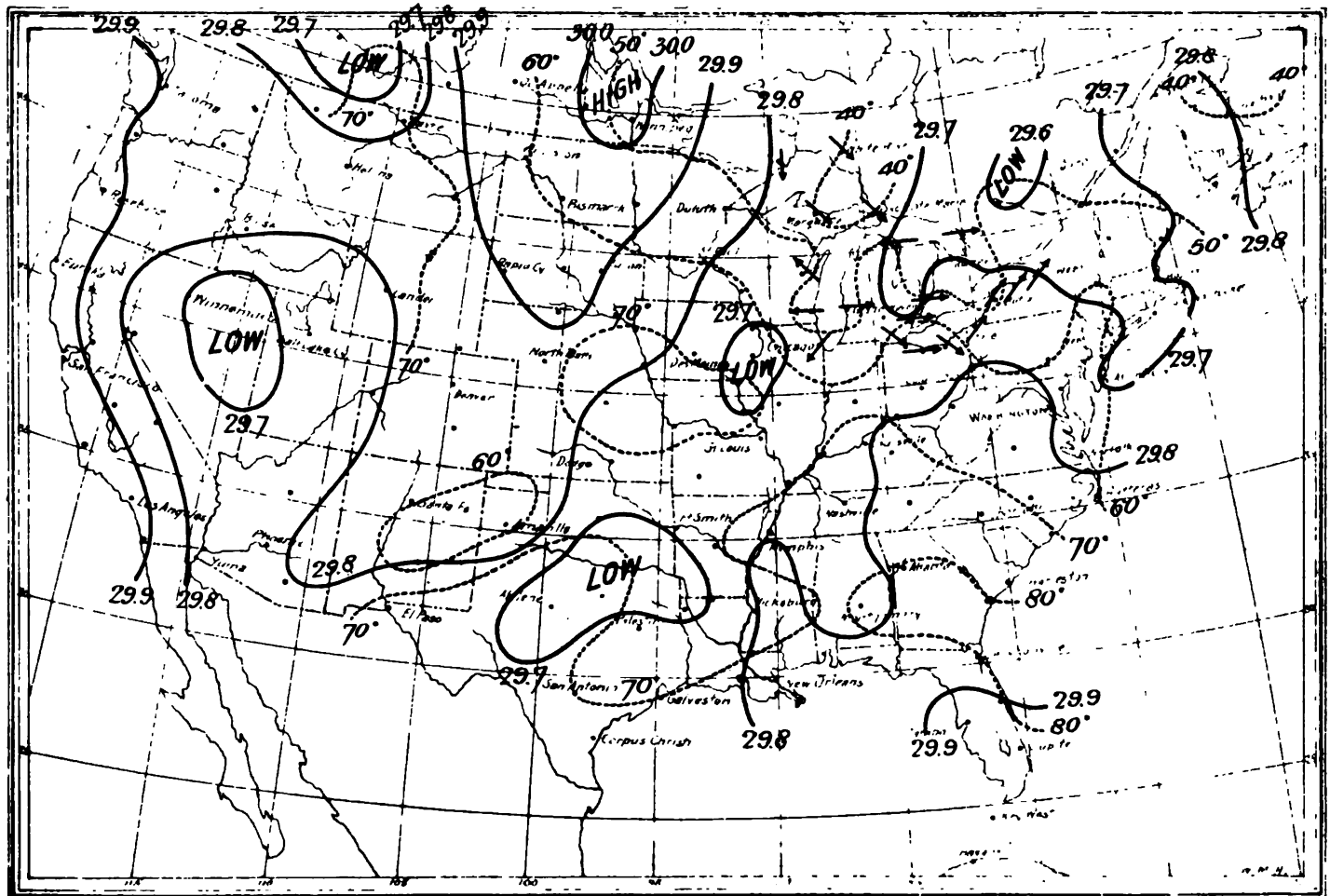
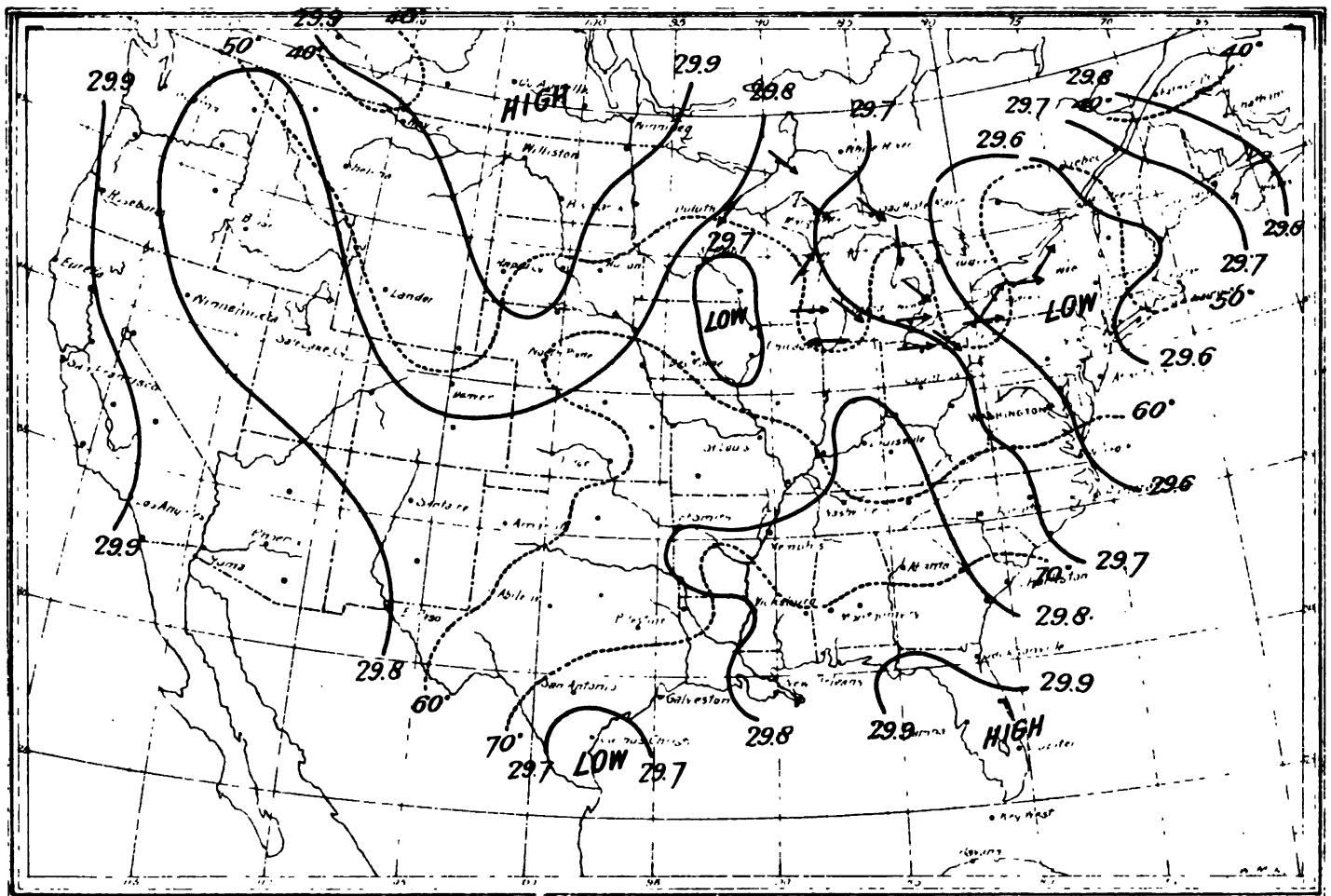


Chart CCCCXVII.

May 15, 1898—8 a. m.

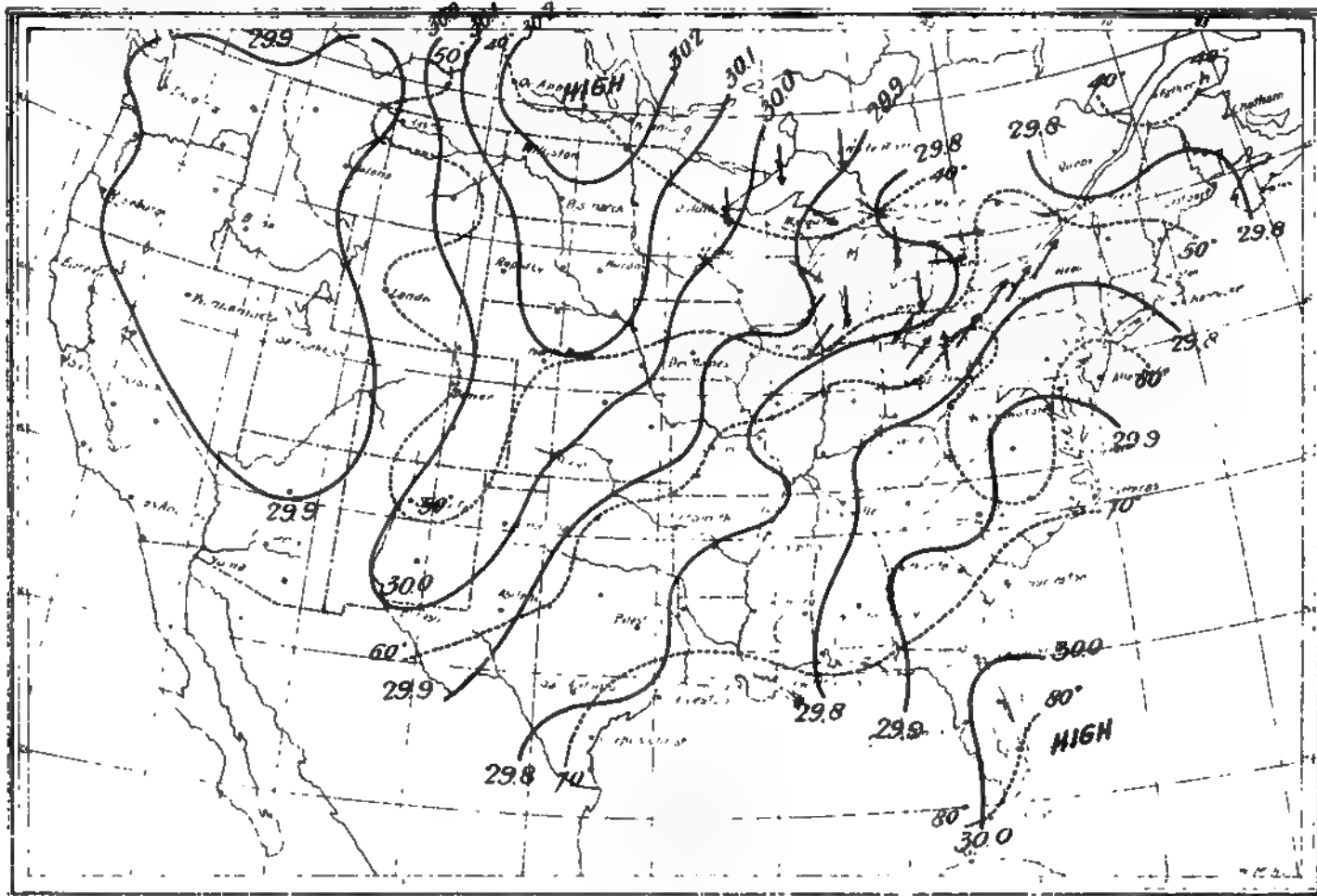
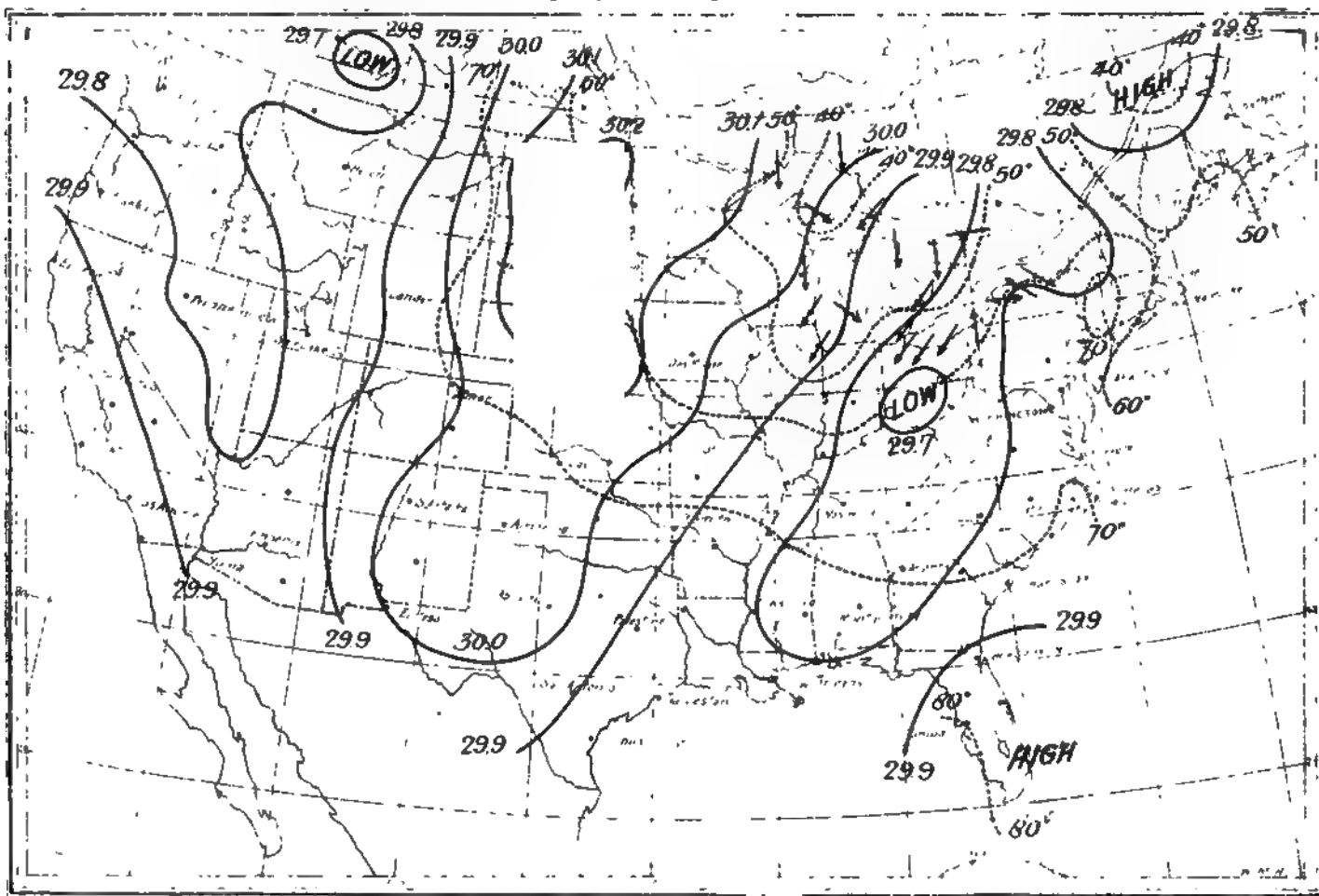


Chart CCCCXVIII.

May 15, 1898—8 p. m.



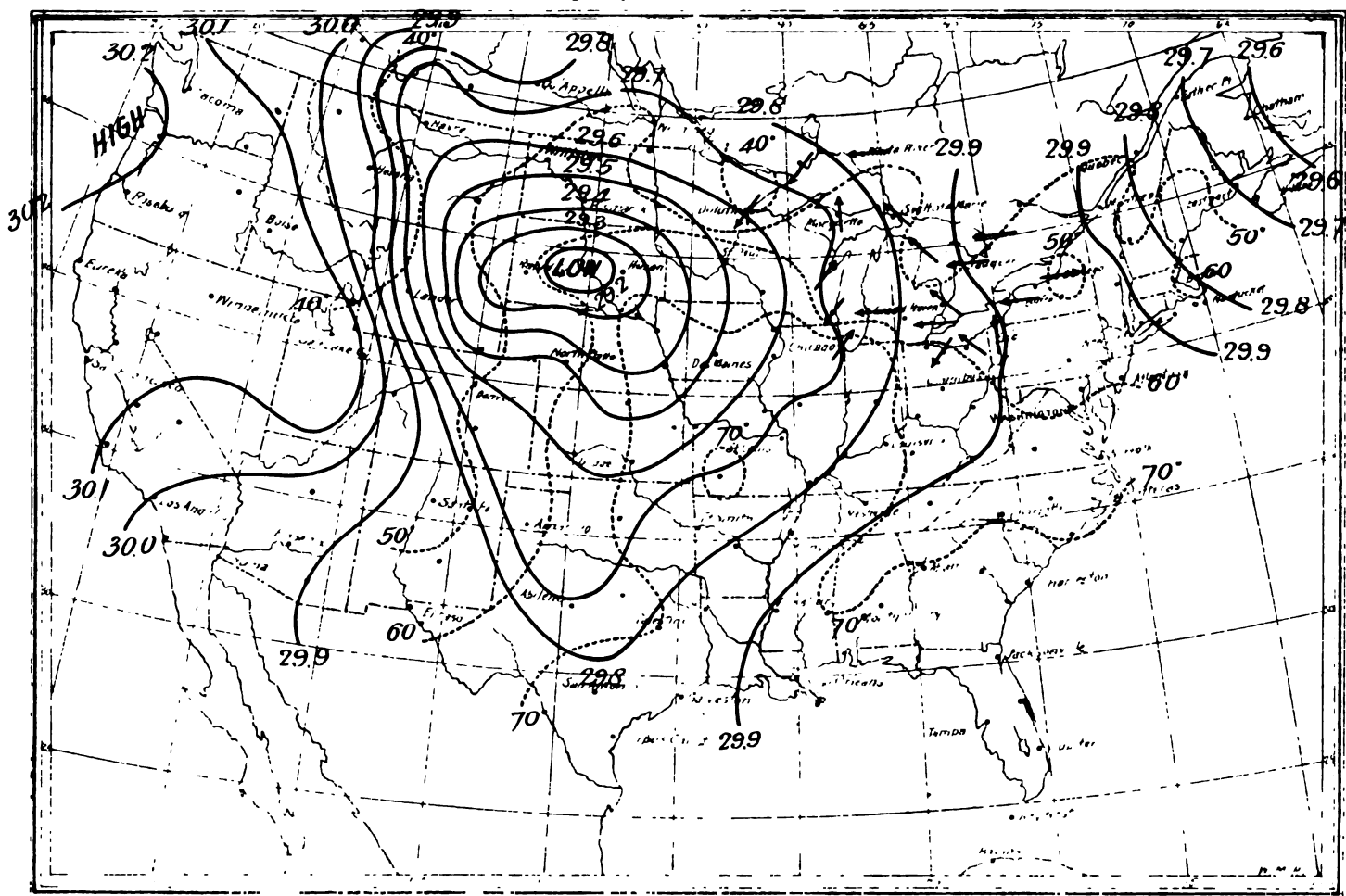


Chart OOOXXX.

May 16, 1894—8 p. m.

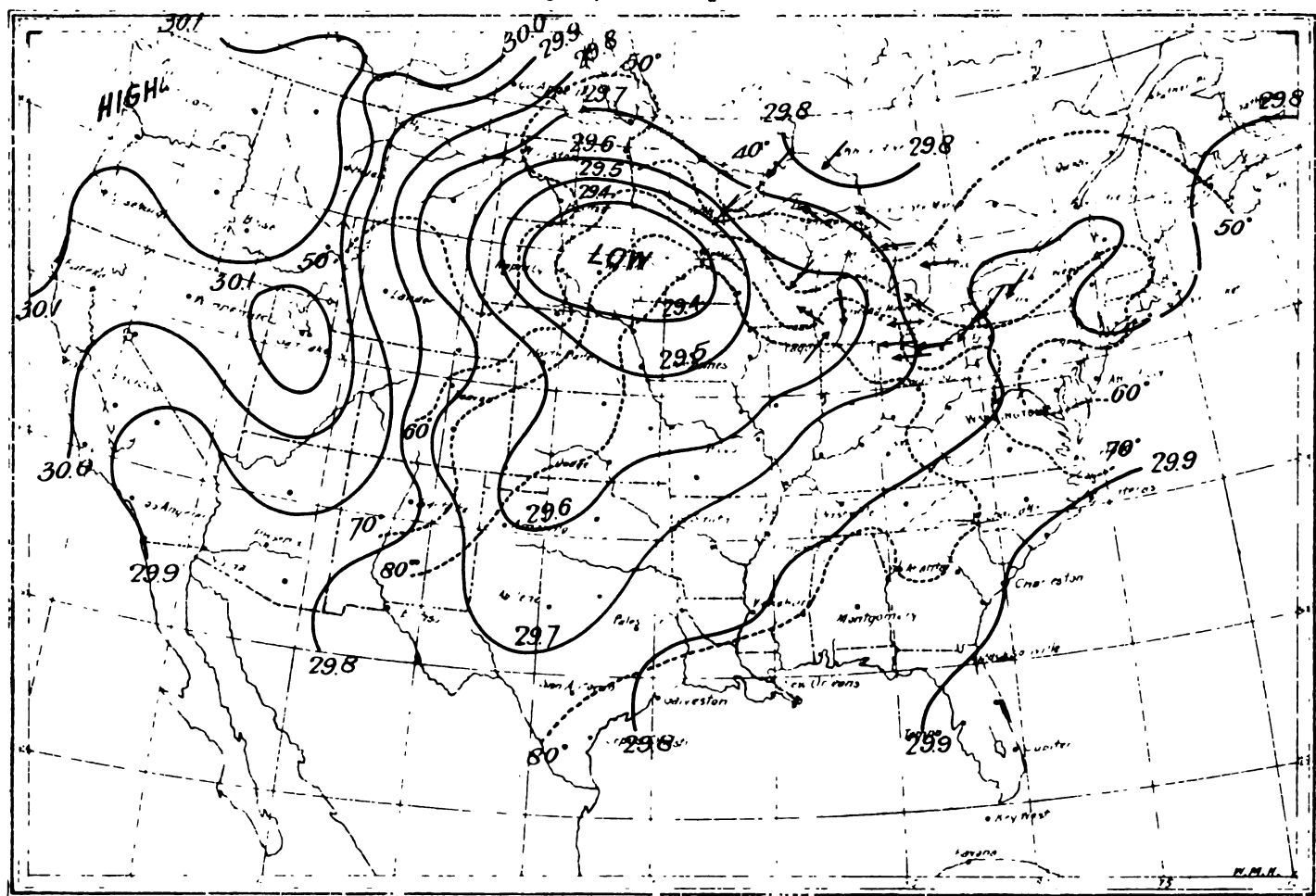


Chart OOOXXXI.

May 17, 1894—8 a. m.

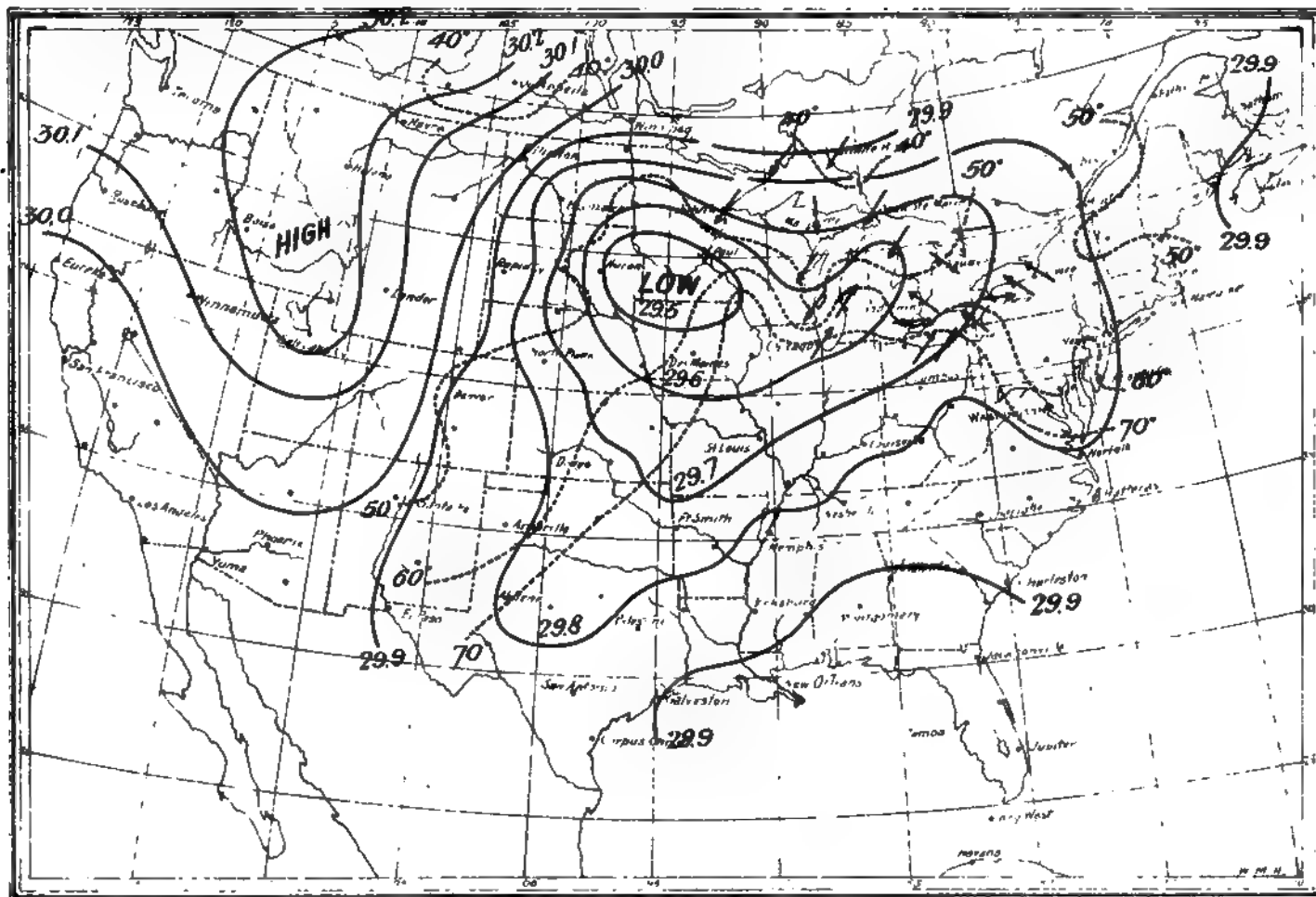


Chart OOOXXXII.

May 17, 1894—8 p. m.

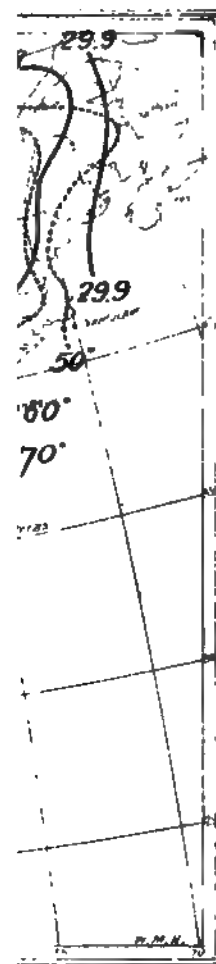


Chart 00000000

May 16, 1900—S. A. M.

Chart

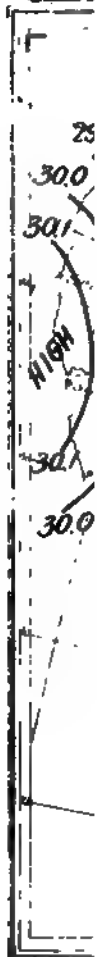


Chart CCCCXXV.

May 17, 1898—8 a. m.

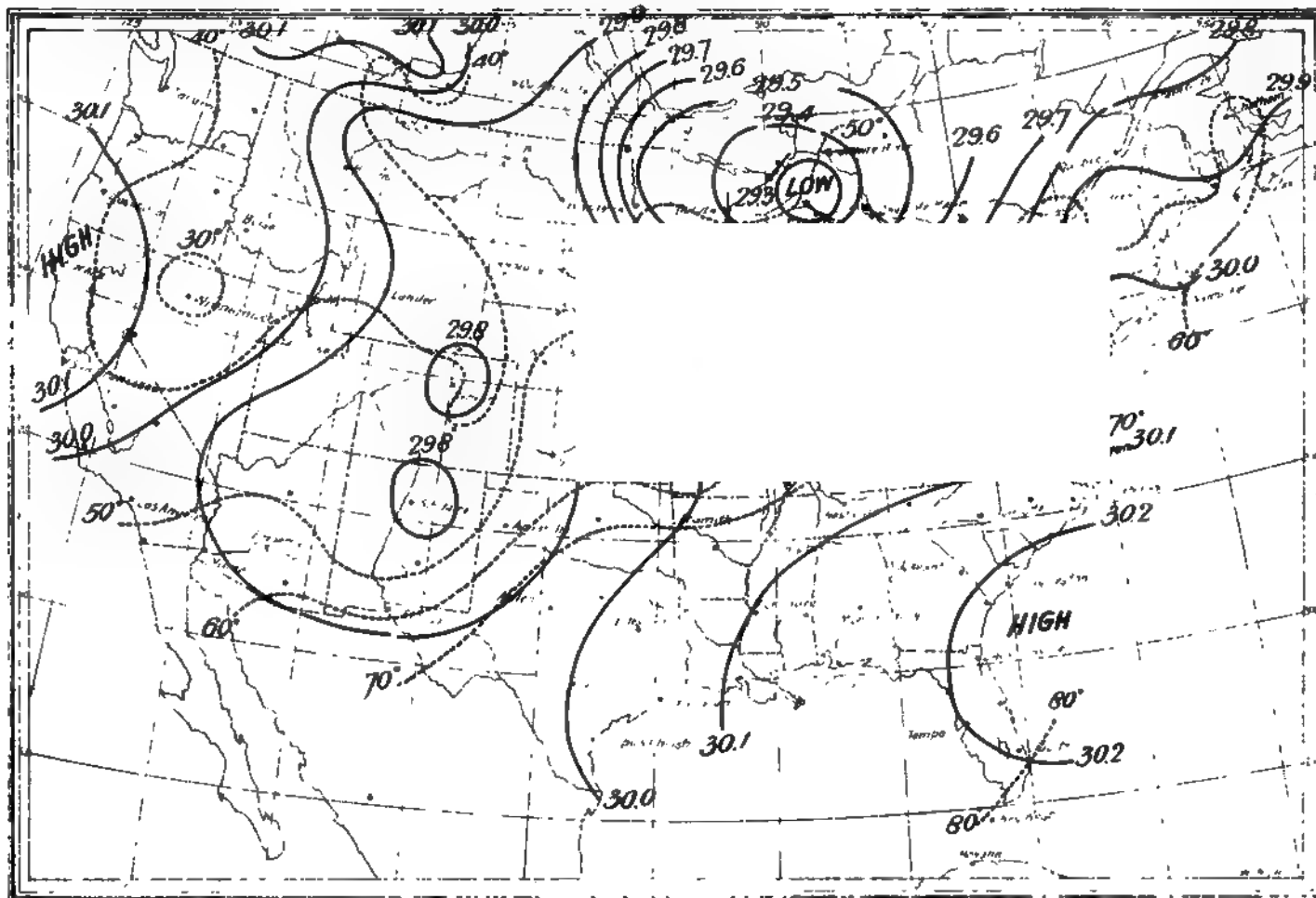


Chart CCCCXXVI

May 17, 1896—8 p. m.

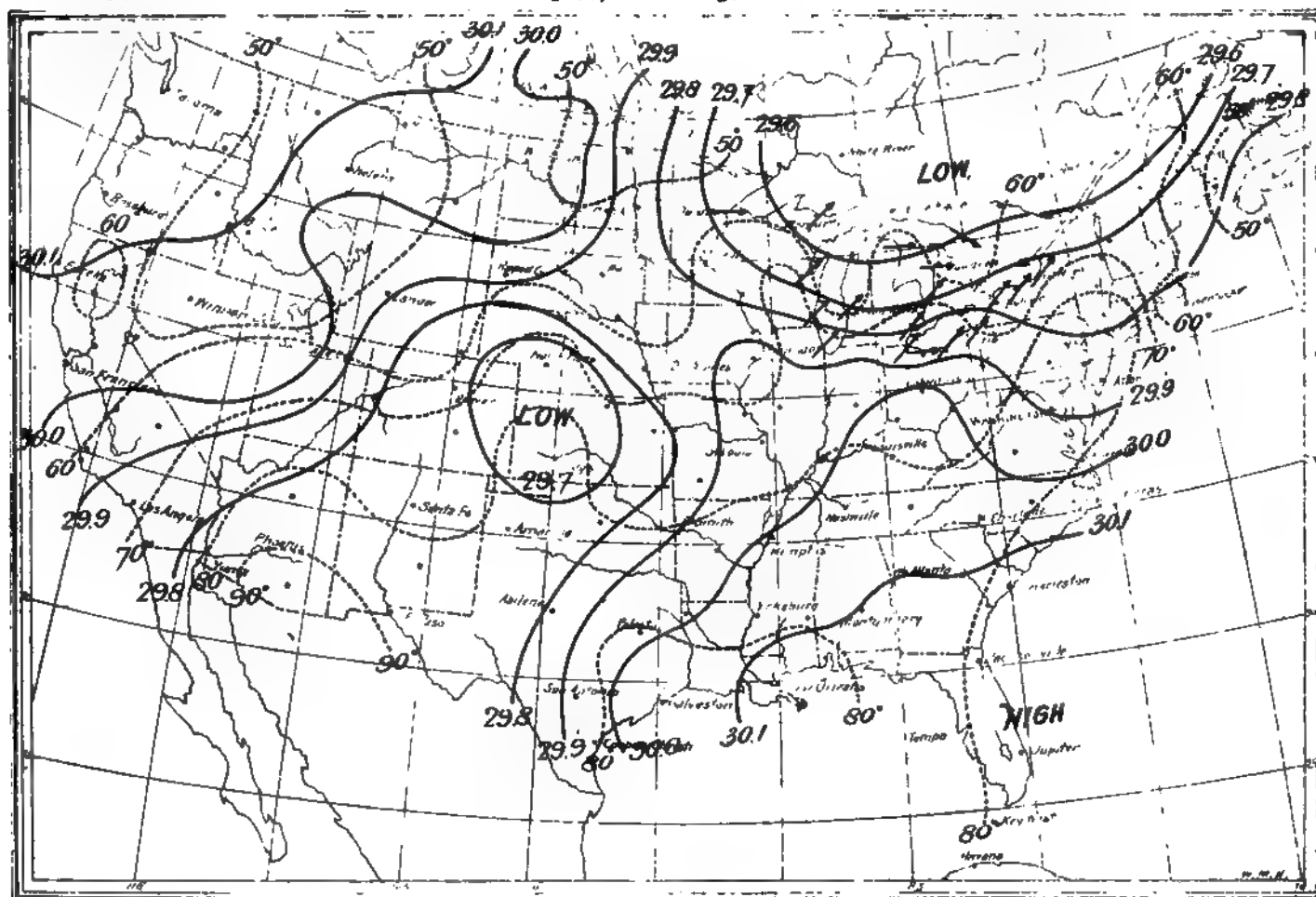


Chart OOOXXXVII.

May 24, 1896—8 a. m.

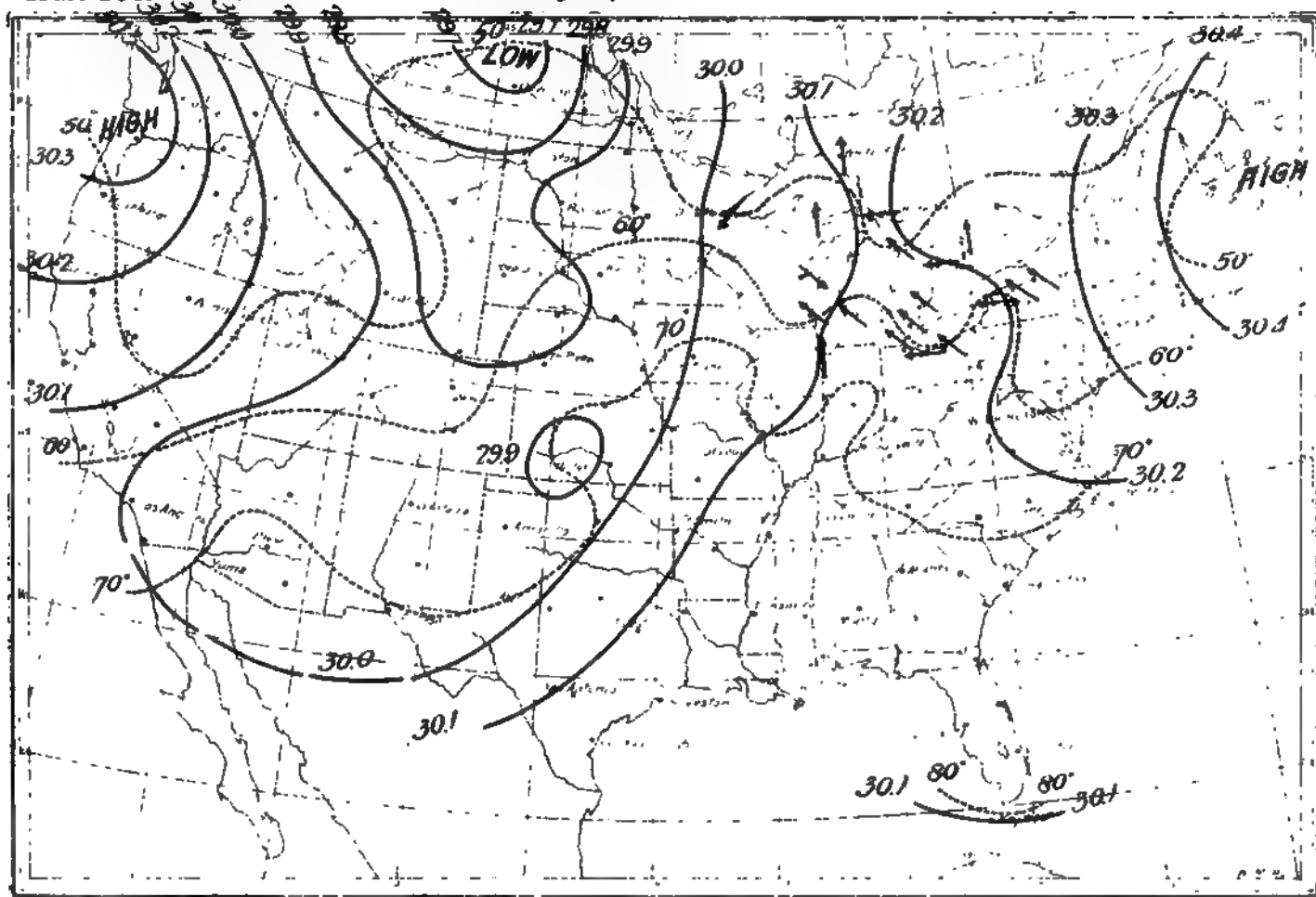


Chart OOOXXXVIII.

May 24, 1896—8 p. m.

Chart CCCCXXIX.

May 25, 1896—8 a. m.

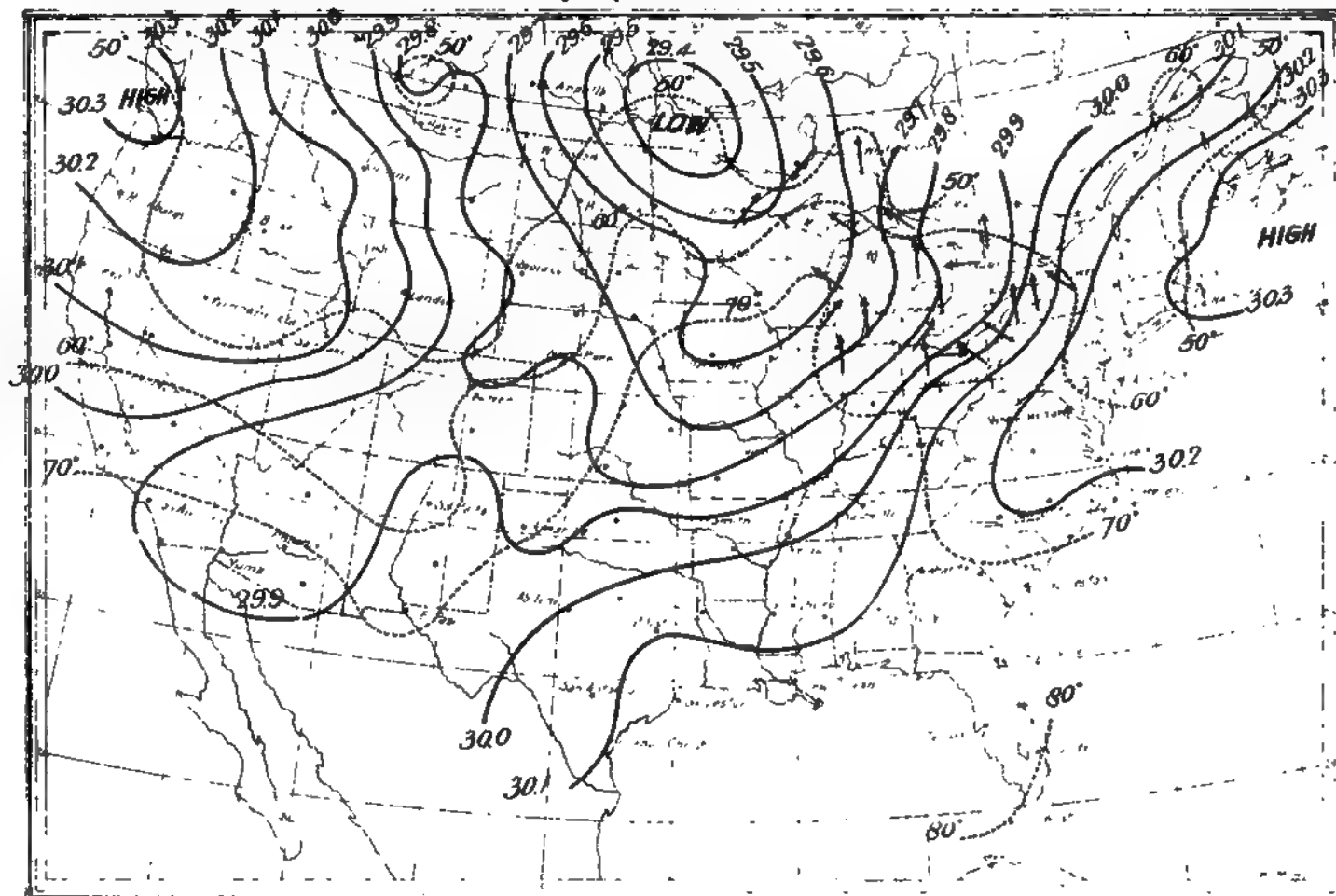


Chart CCCCXL.

May 26, 1896—8 p. m.

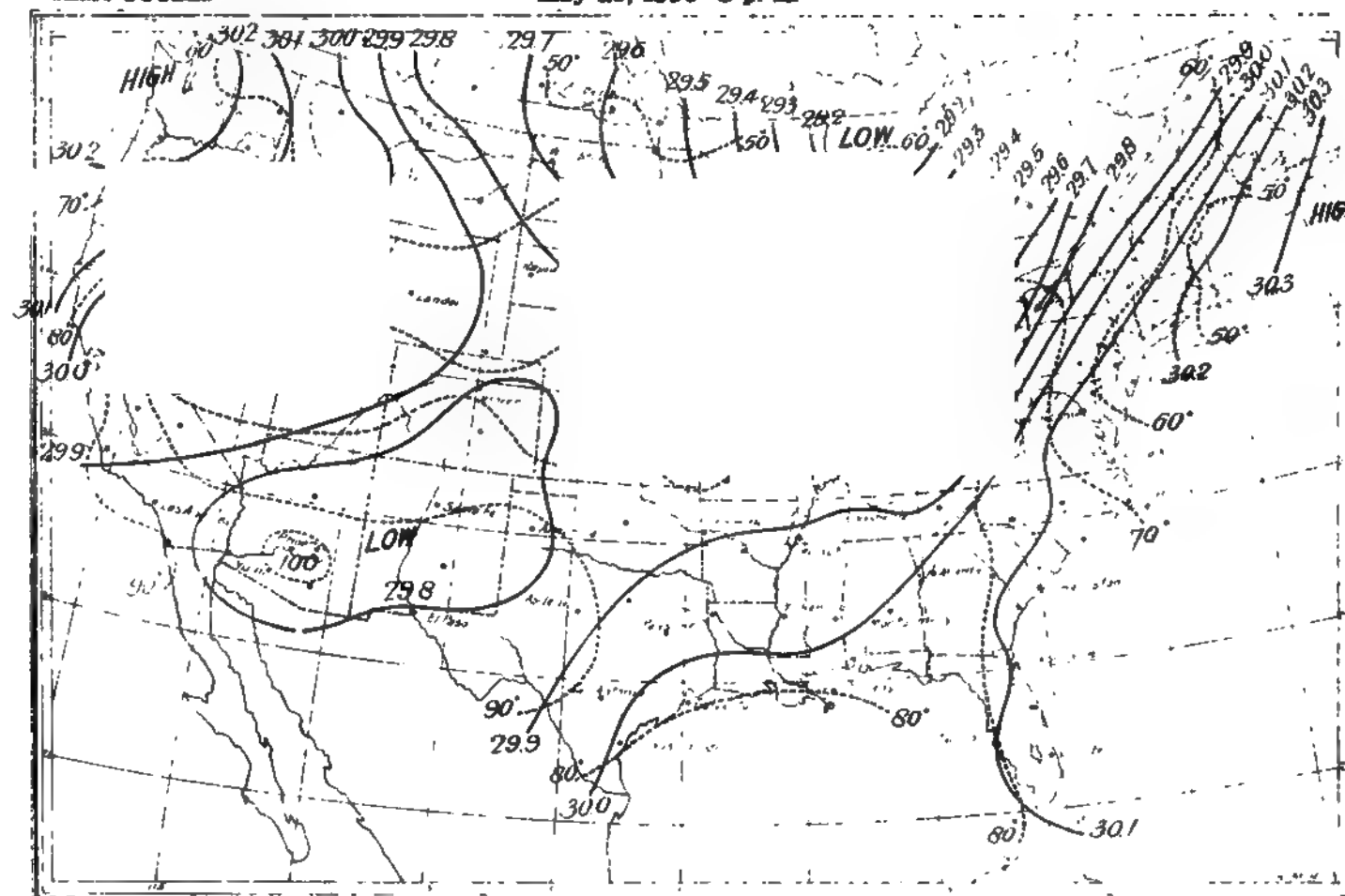


Chart 000XLI.

May 26, 1896—8 a. m.

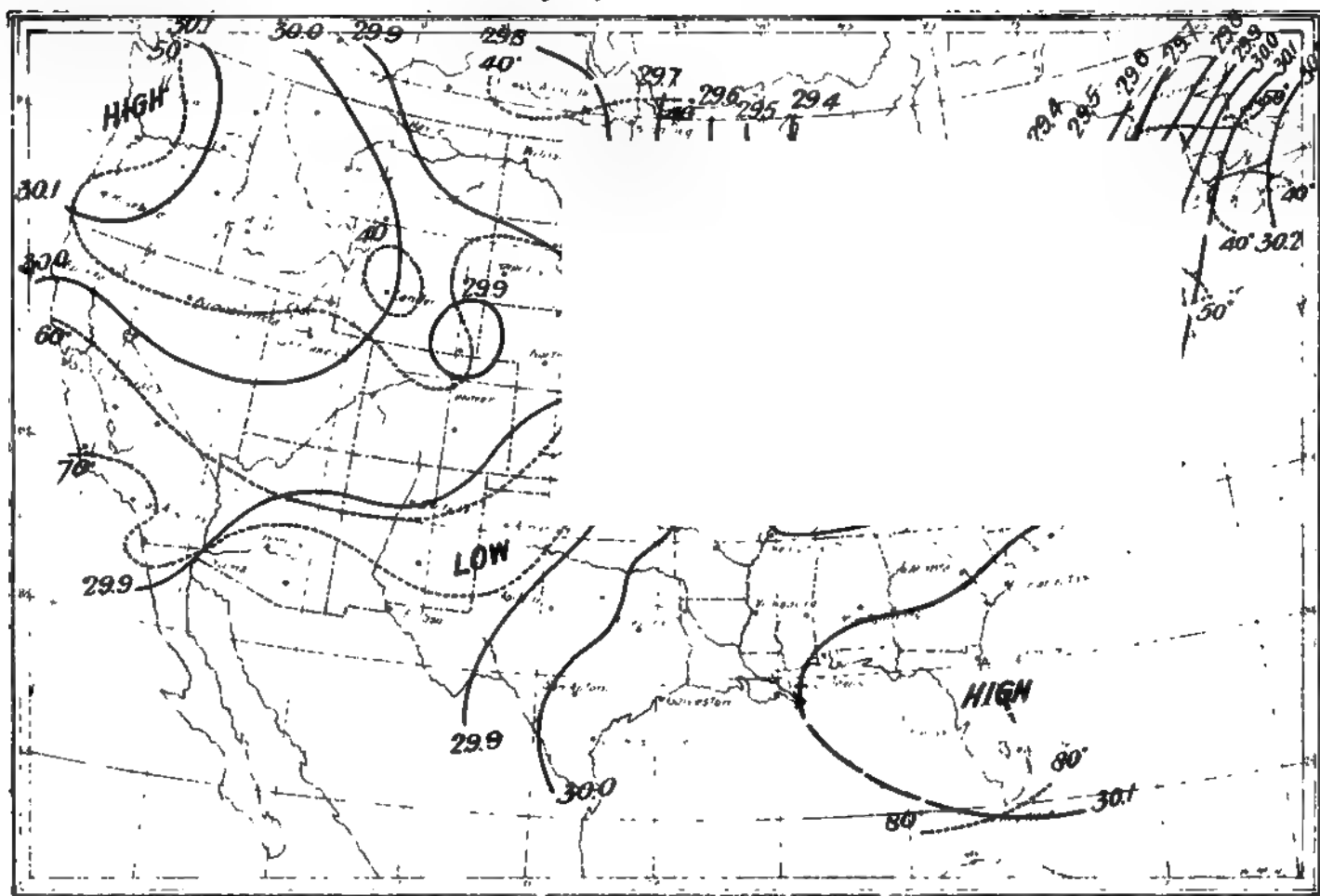


Chart 000XLI.

May 26, 1896—8 p. m.

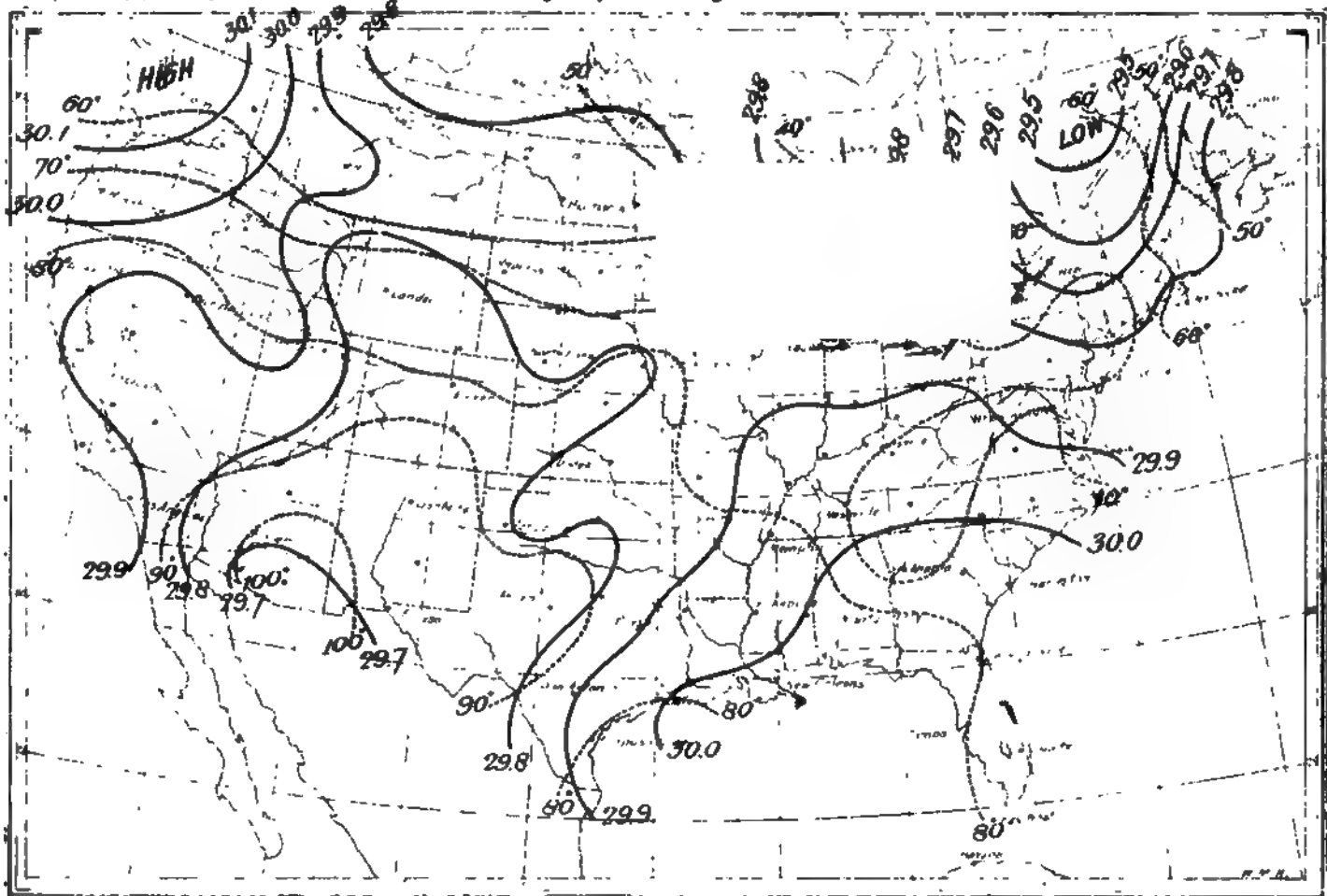


Chart CCOXLIII.

May 27, 1896—8 a. m.

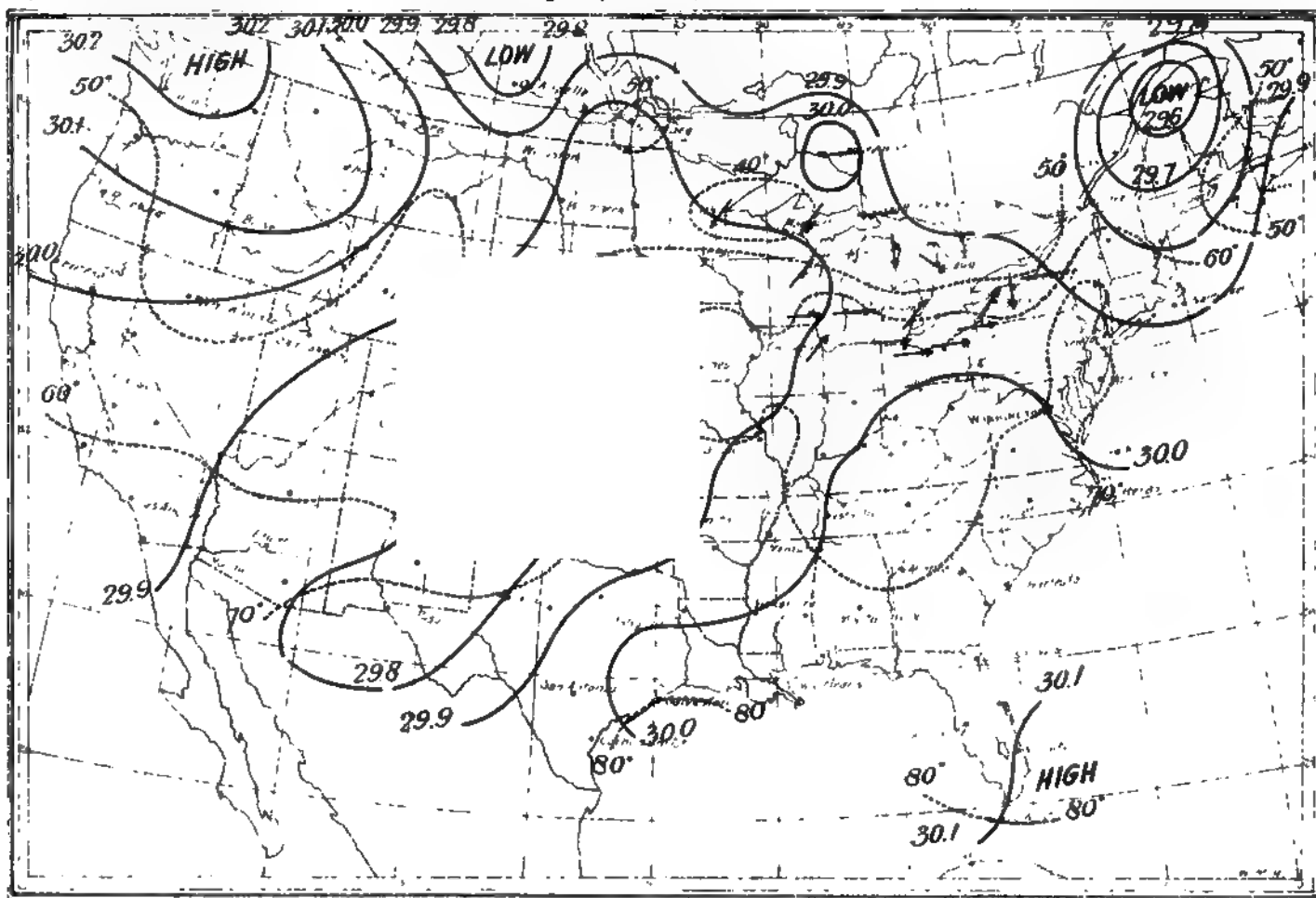


Chart CCOXLIV.

May 27, 1896—8 p. m.

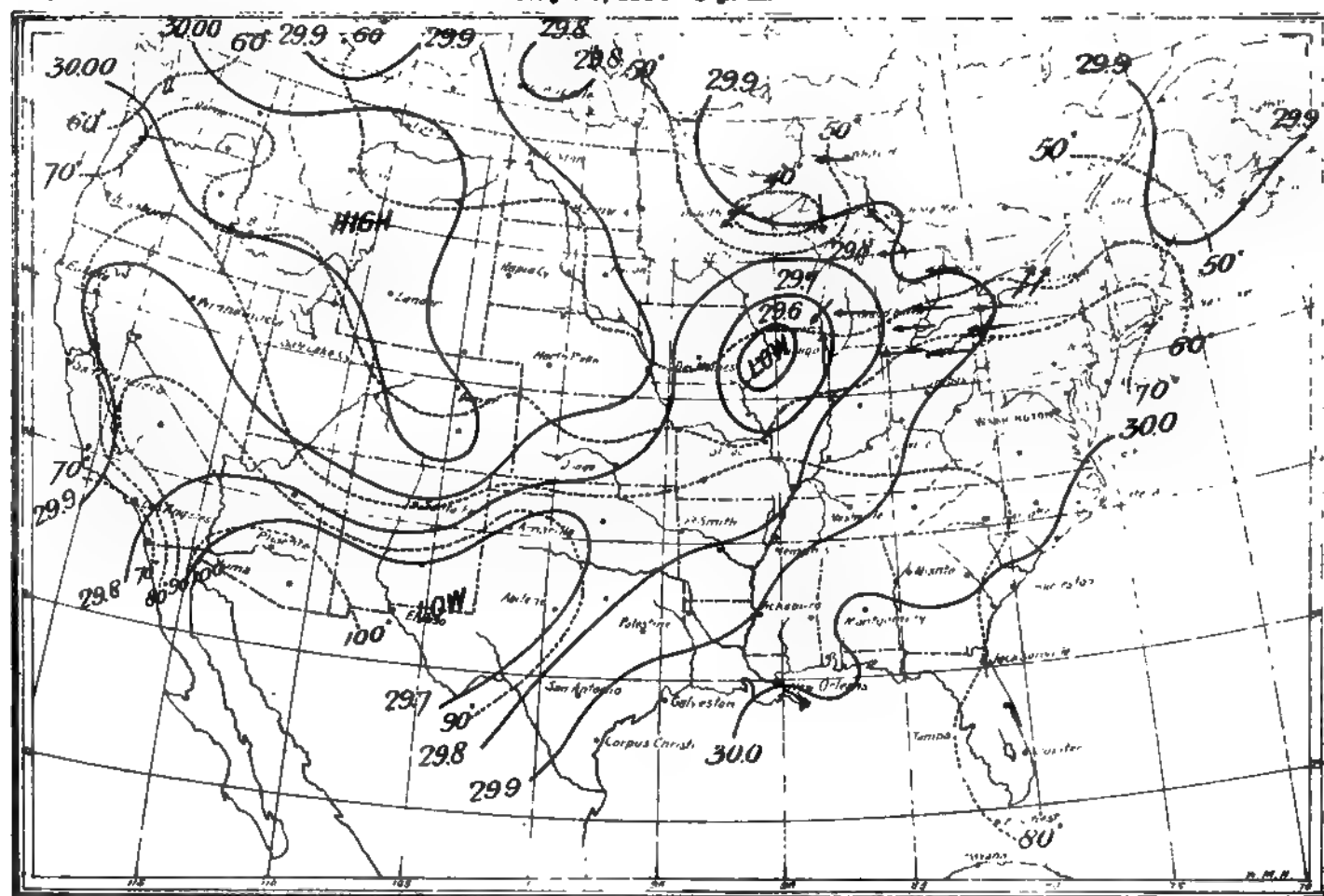


Chart CXXLV.

May 17, 1898—3 p. m.

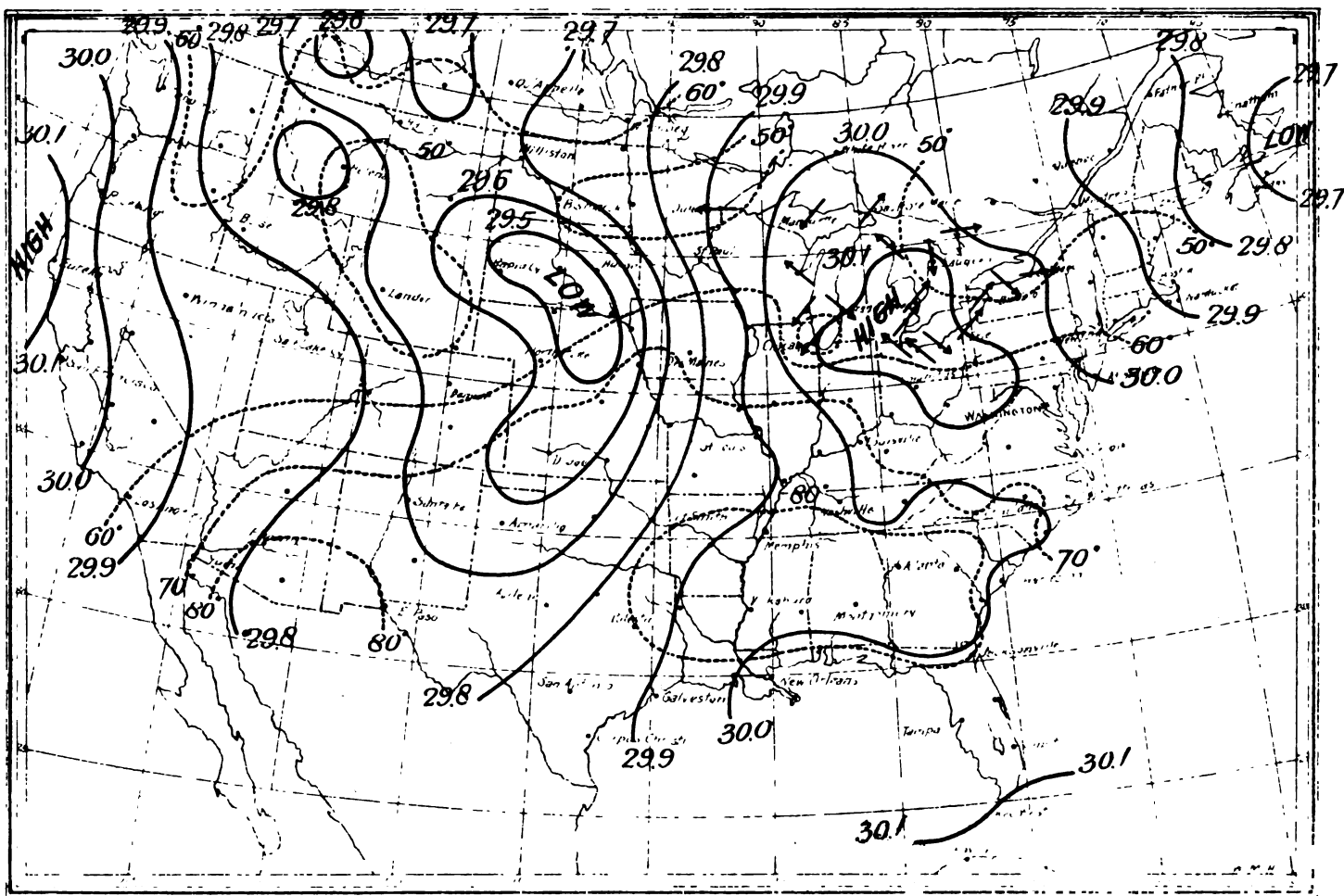


Chart CXXLVI.

May 18, 1898—8 a. m.

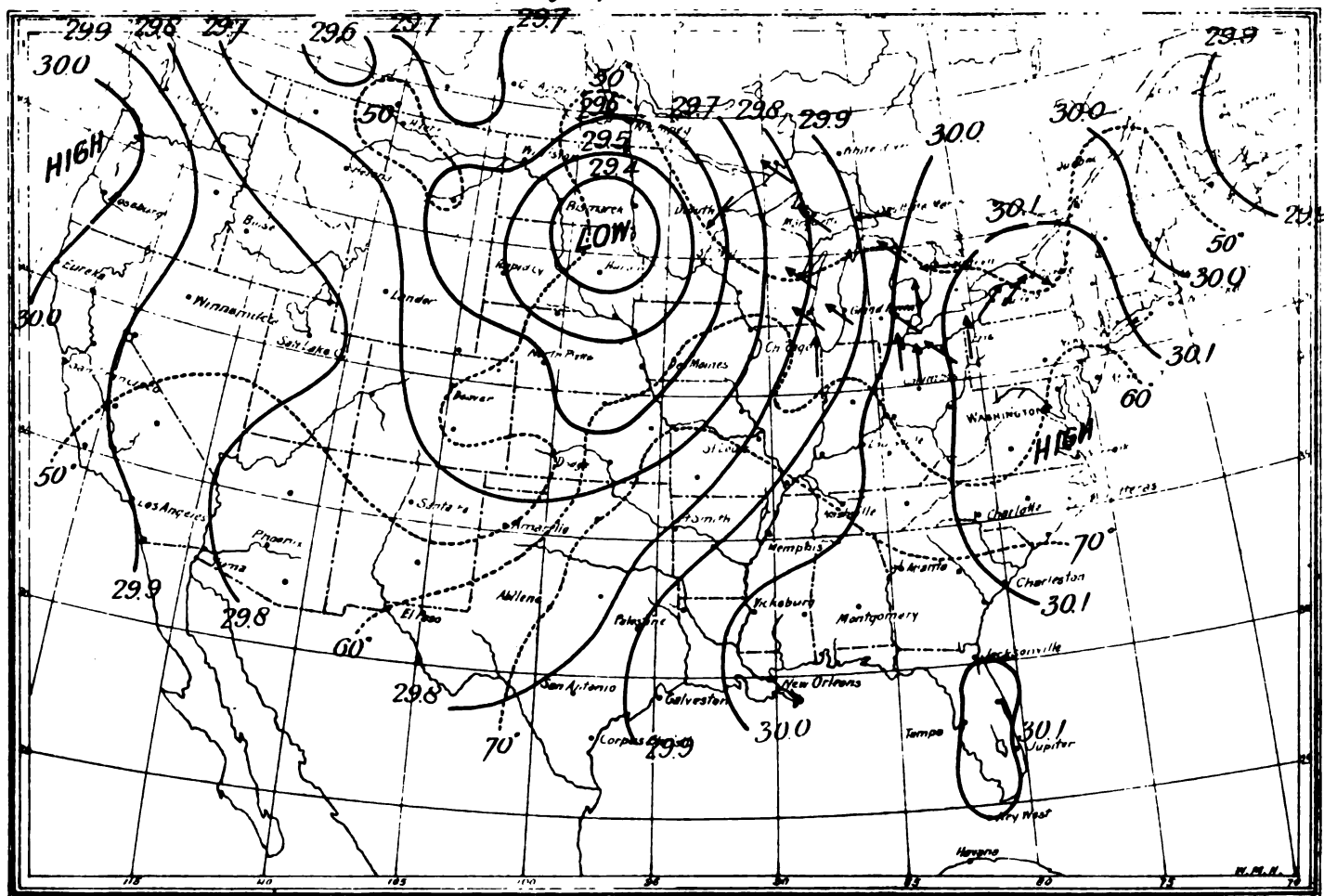


Chart CCOXLVII.

May 18, 1898—8 p. m.

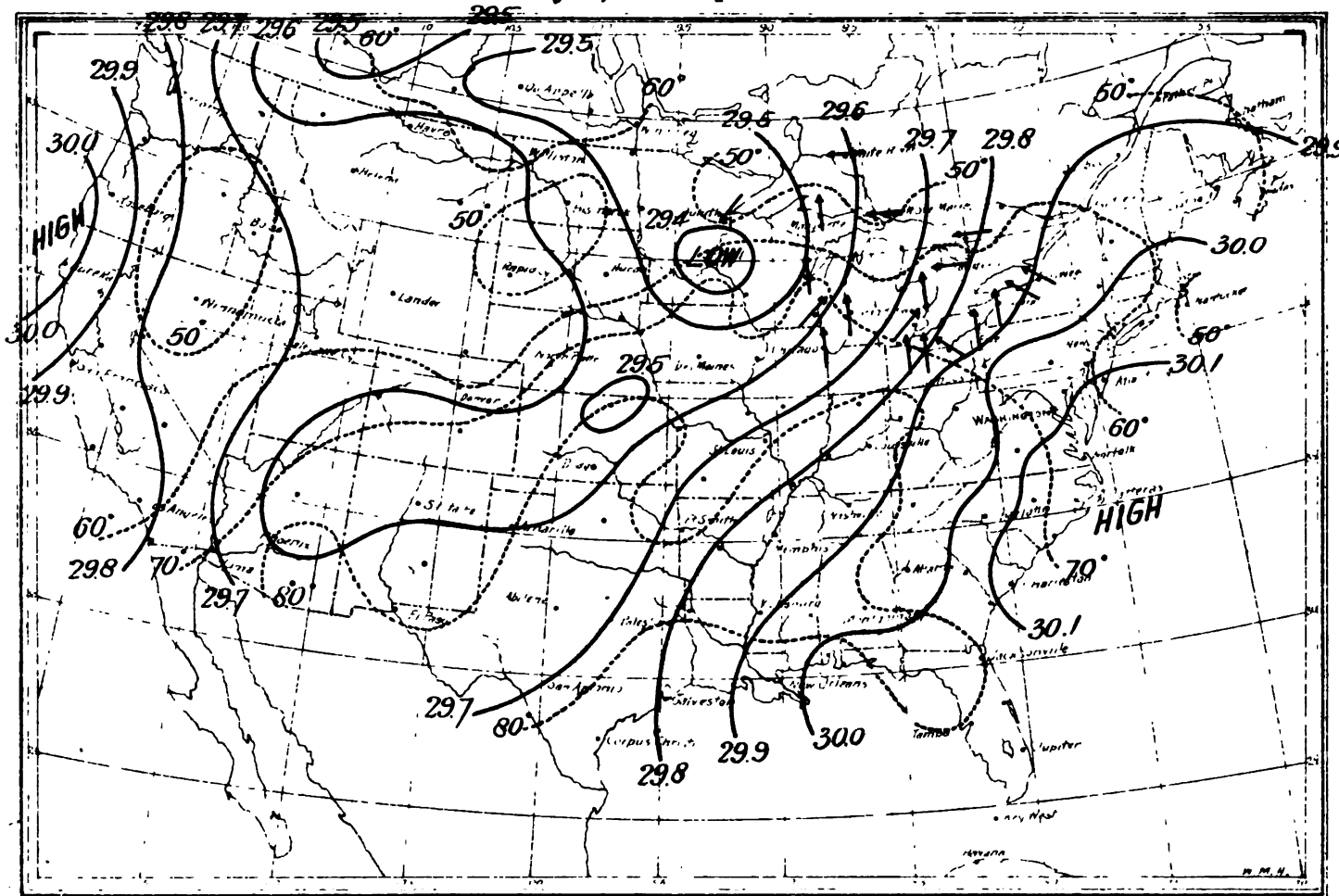


Chart CCOXLVIII.

May 19, 1898—8 a. m.

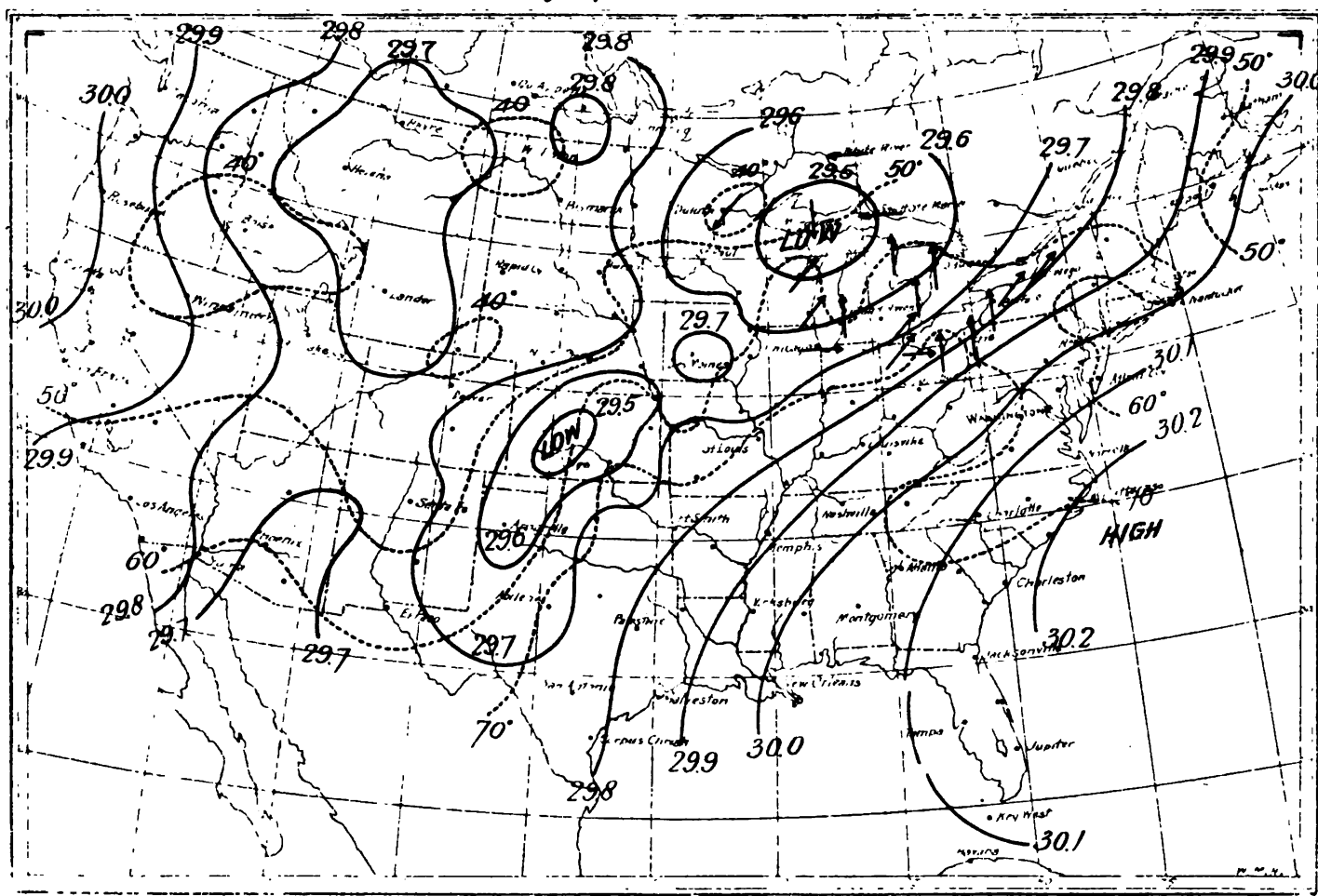


Chart CXXXIX.

June 16, 1876—7:35 a. m.

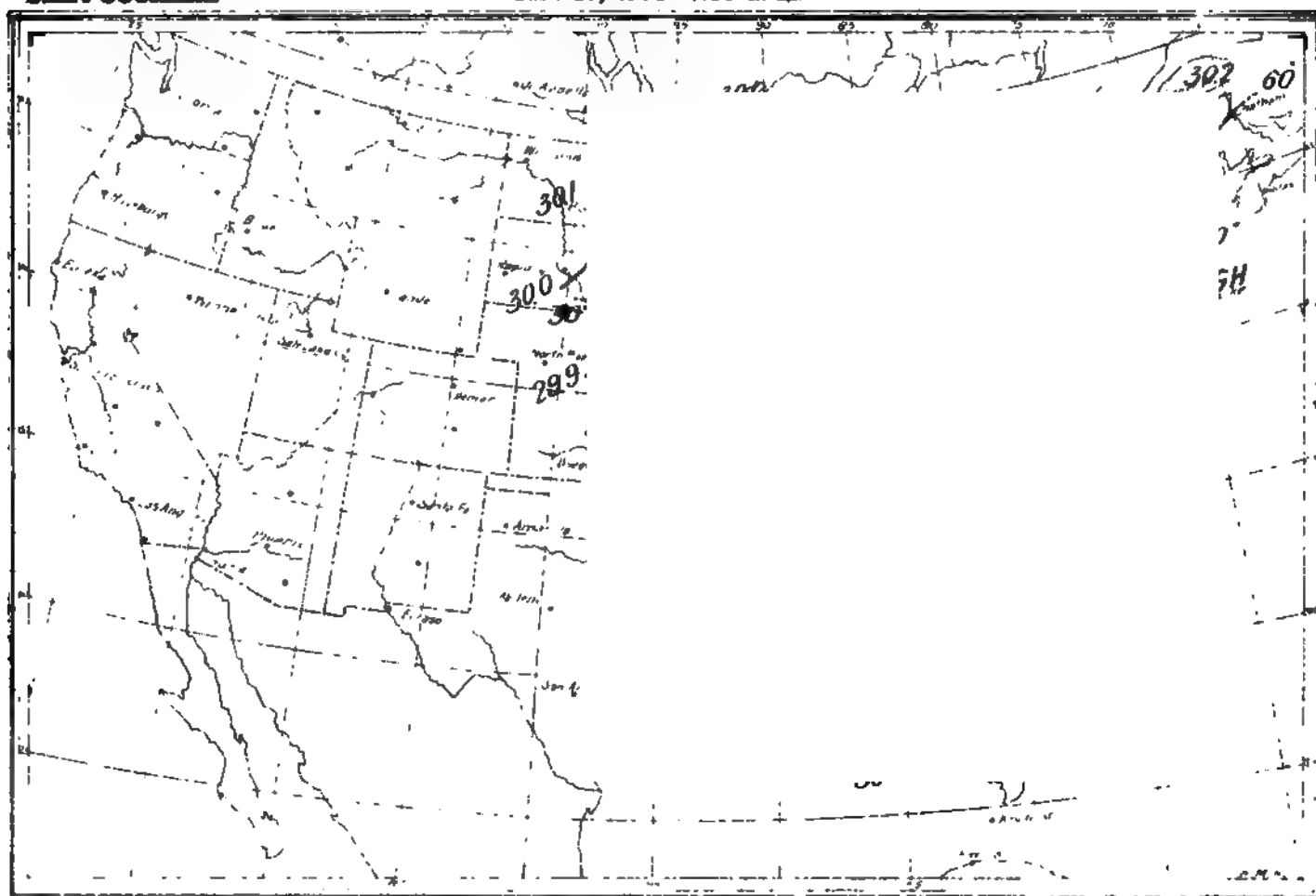


Chart CXXX.

June 16, 1876—4:35 p. m.

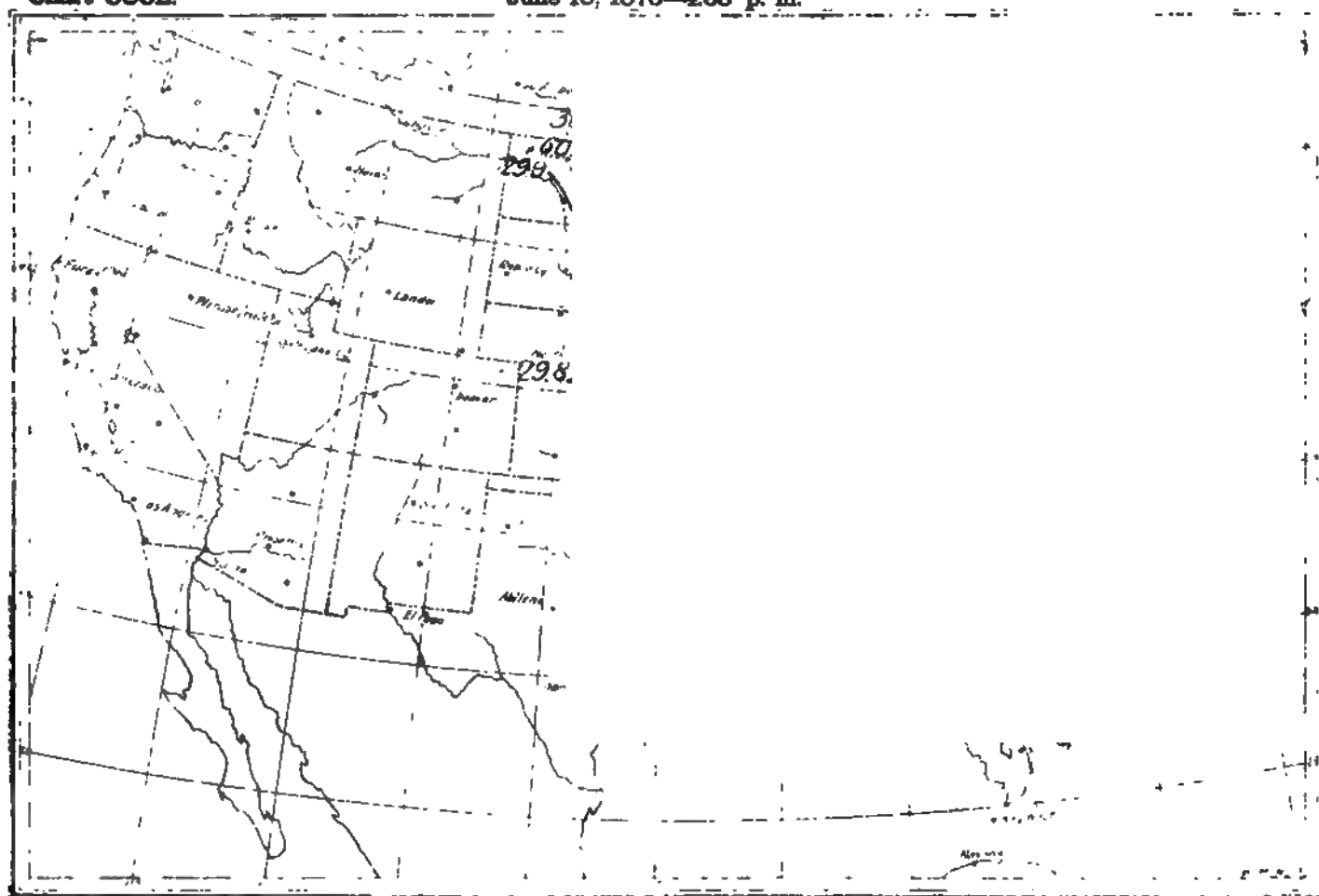


Chart COOL I.

June 17, 1876—7:35 a. m.

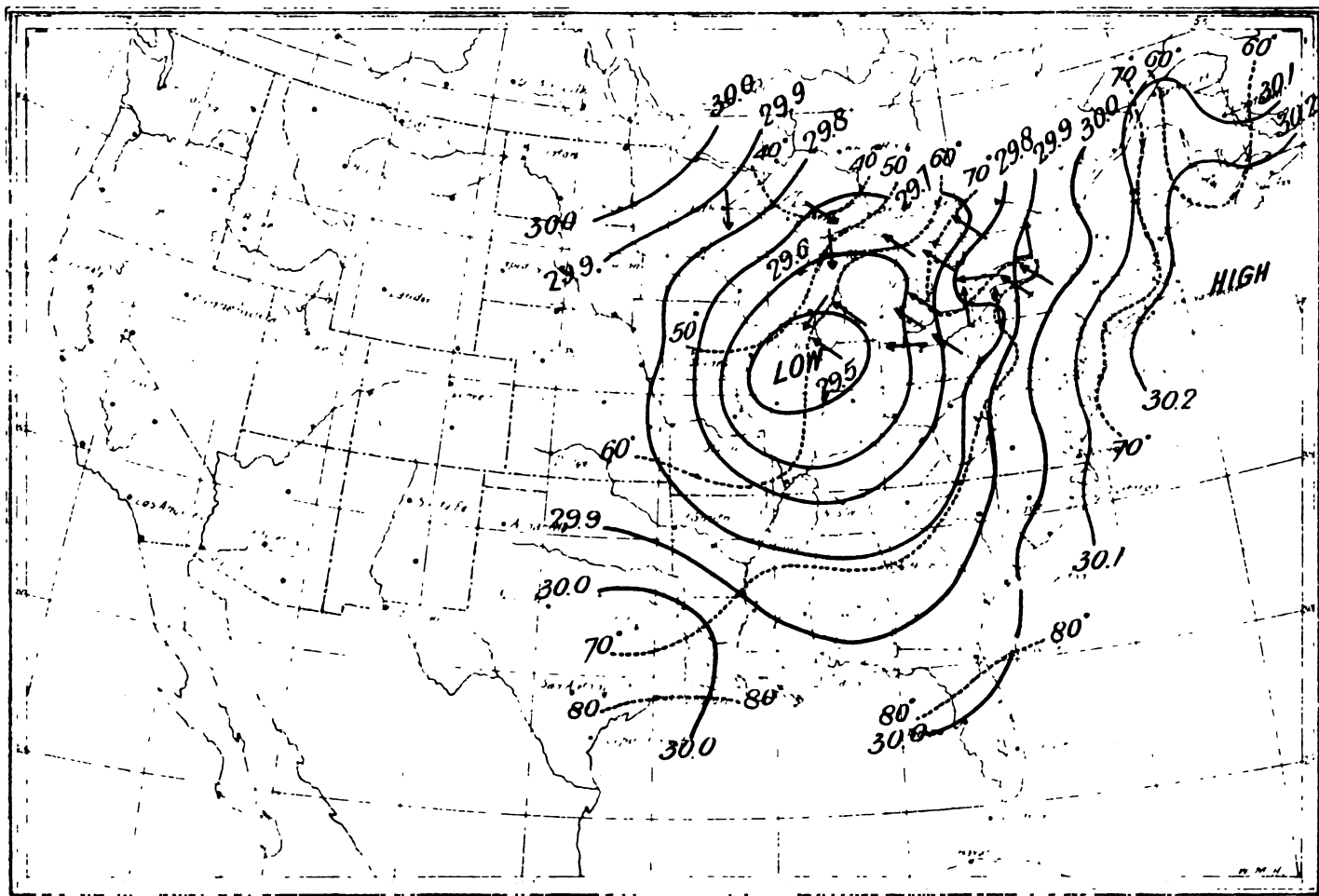


Chart COOL II.

June 17, 1876—4:35 p. m.

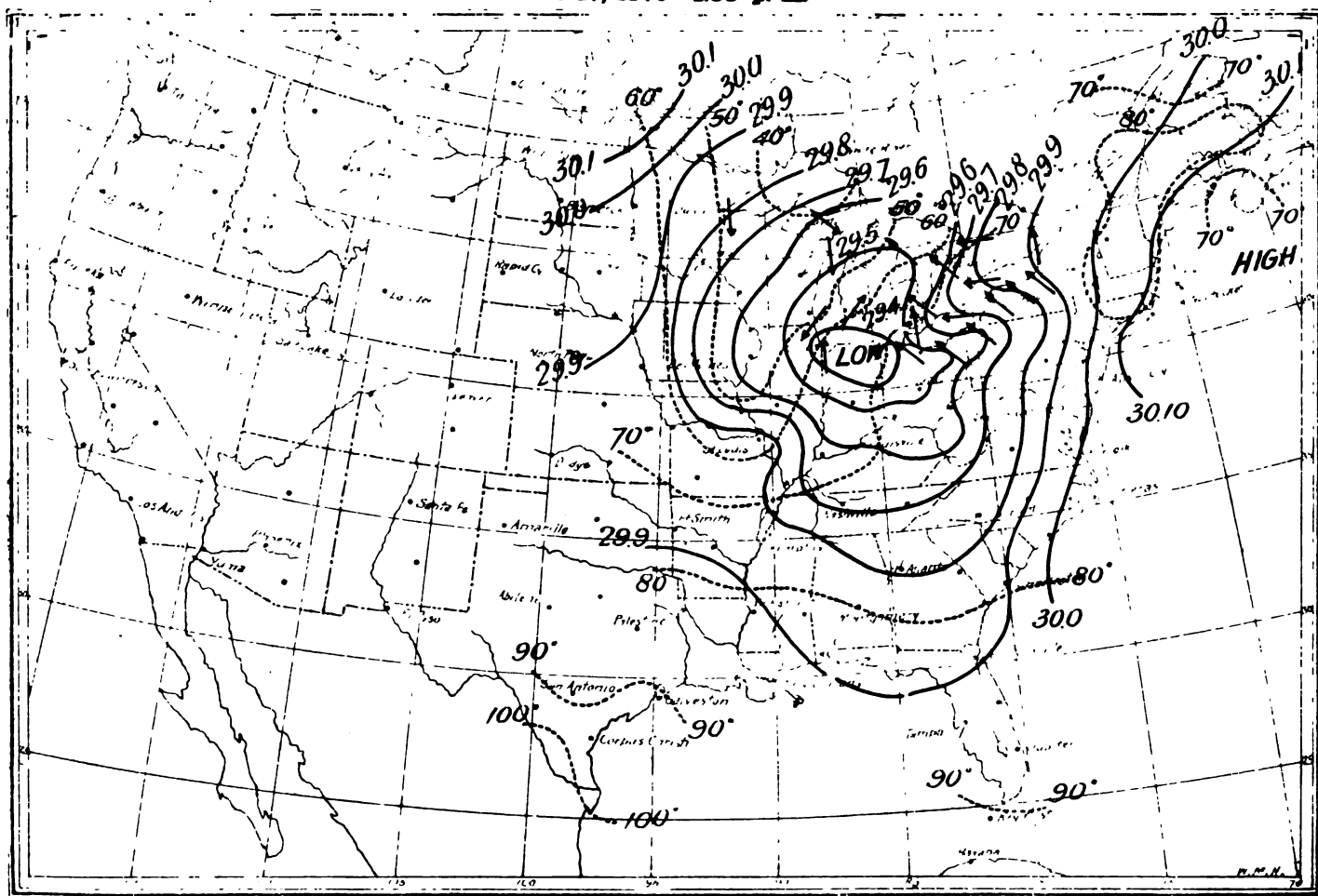


Chart 000LIII.

June 8, 1877—7:35 a. m.

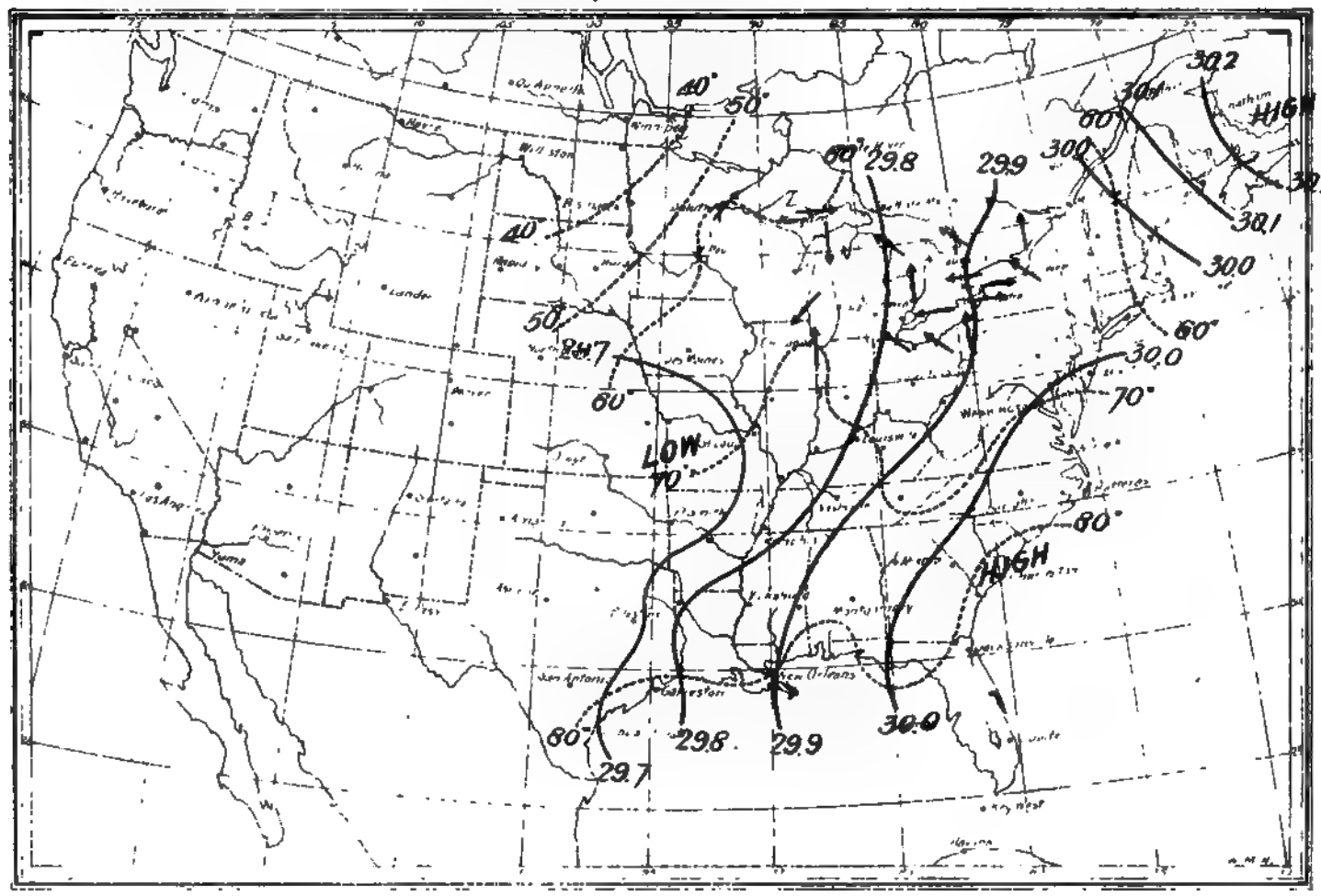


Chart 000LIV.

June 8, 1877—4:35 p. m.

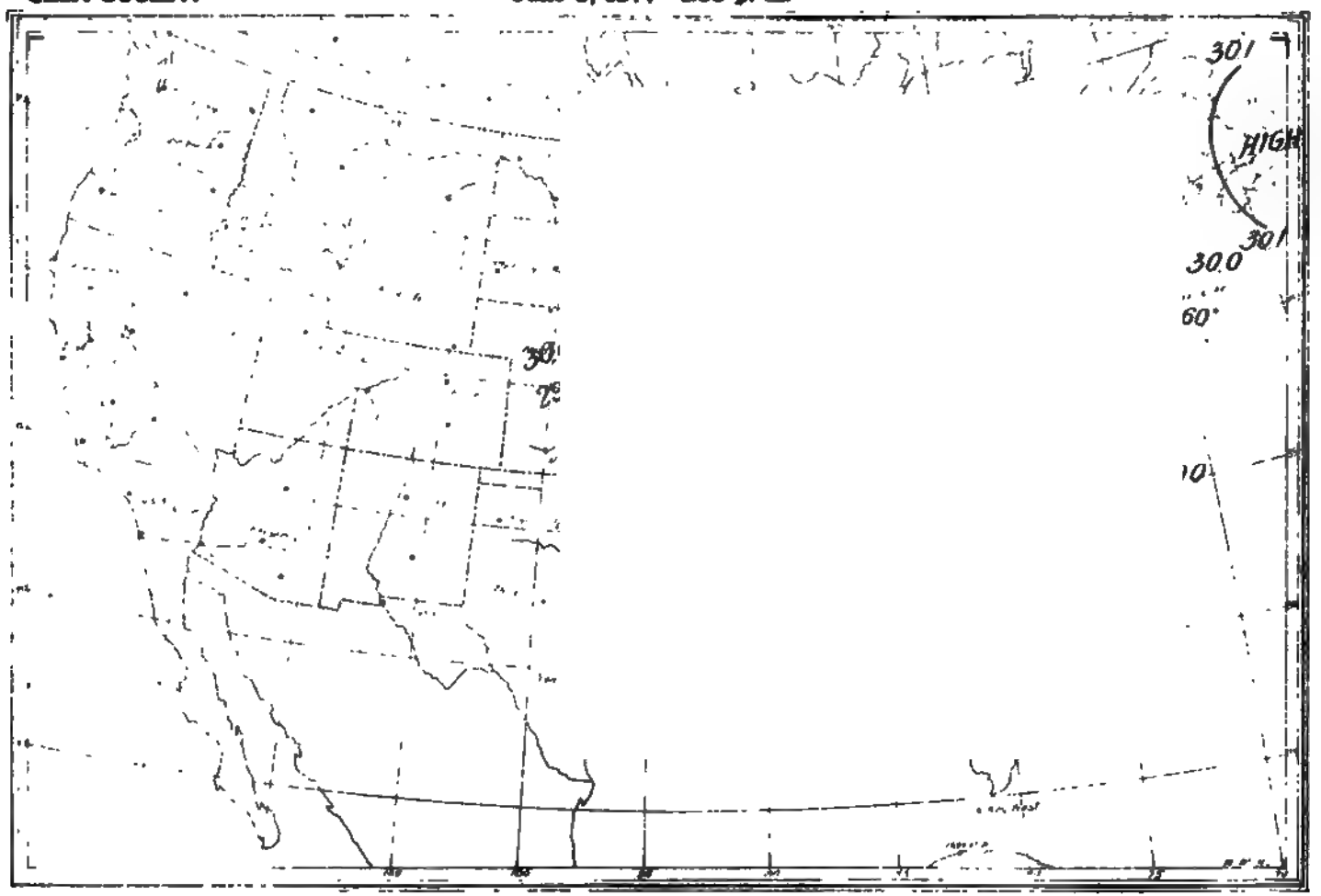


Chart COOLV.

June 9, 1877—7:35 a. m.

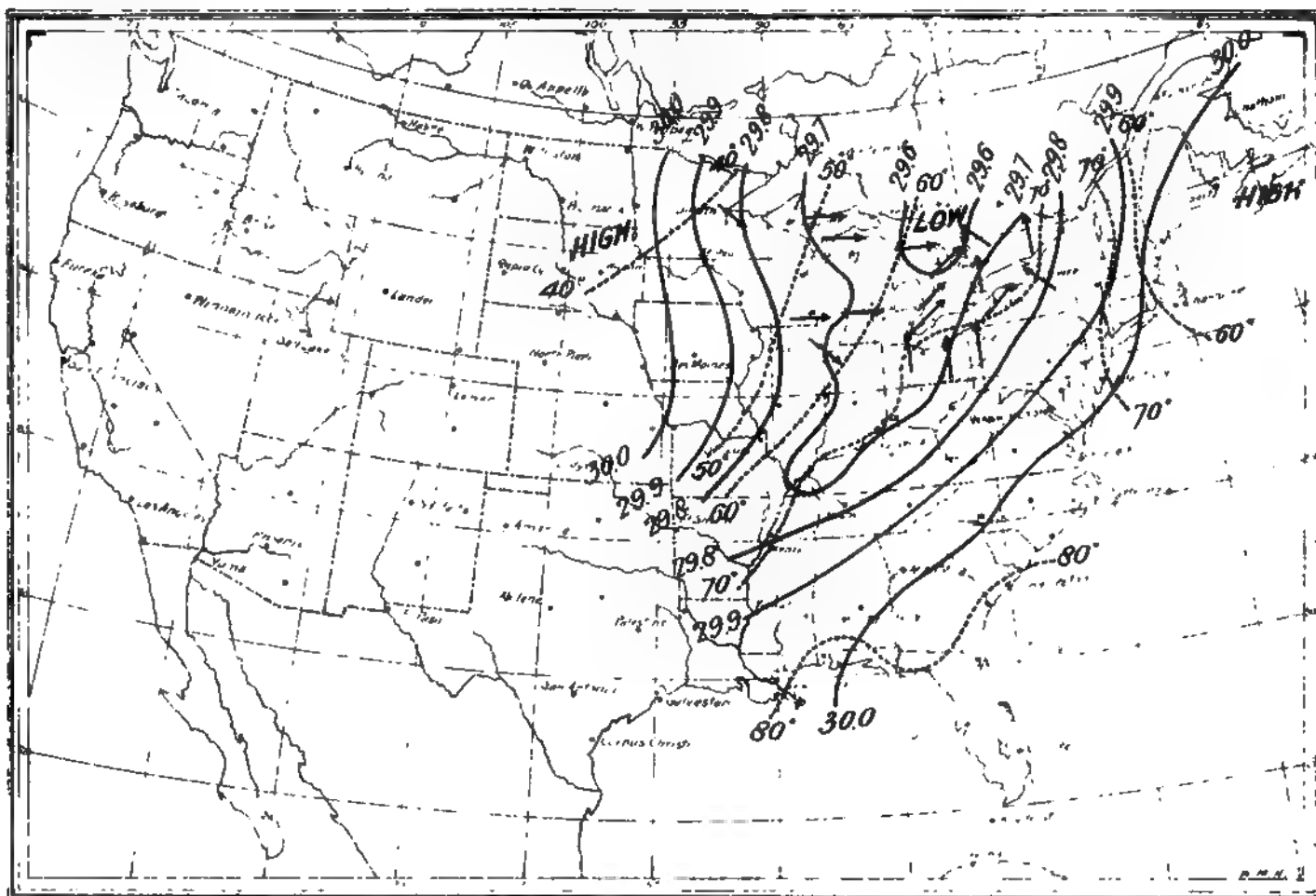


Chart COOLVI.

June 9, 1877—4:35 p. m.

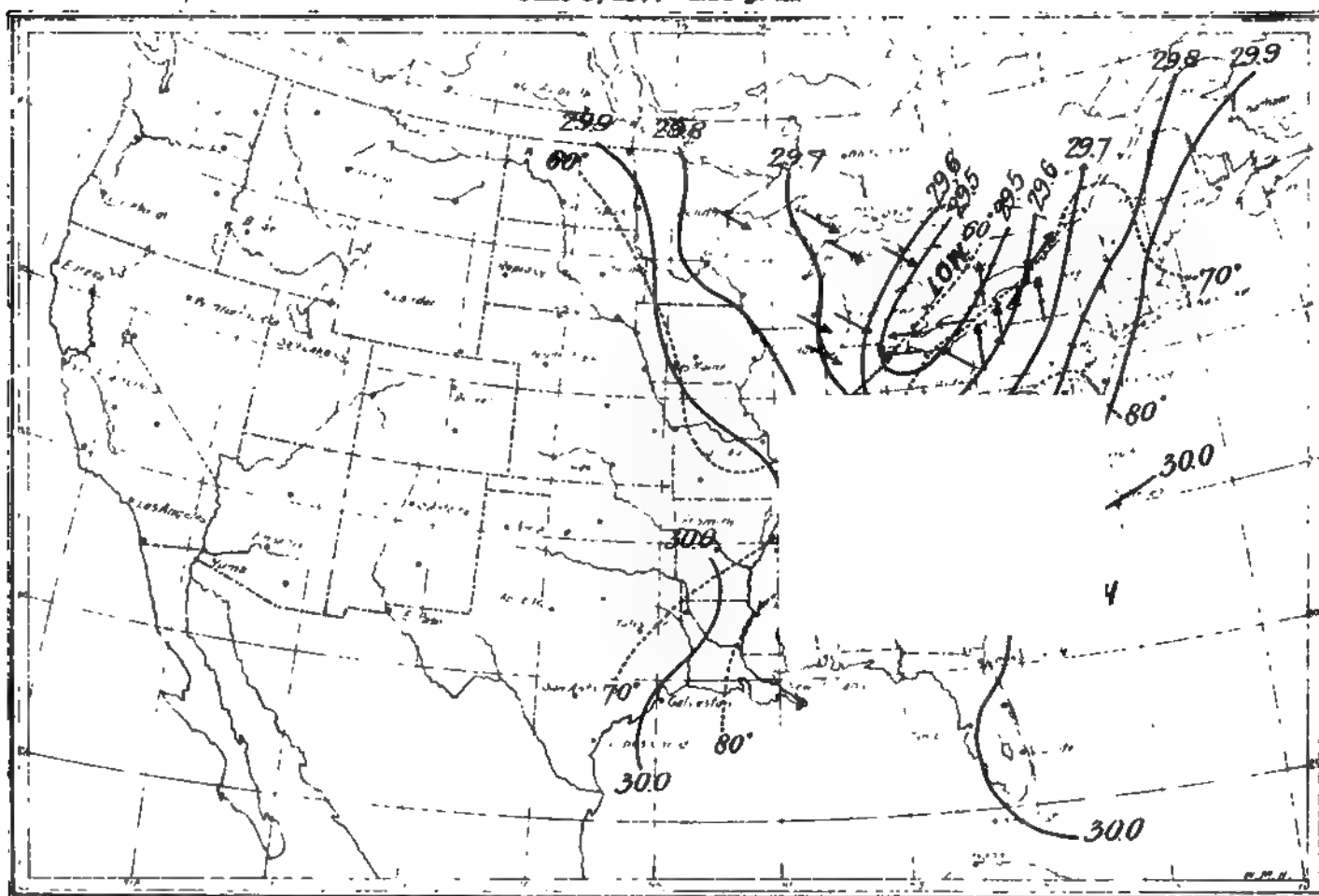


Chart COOL.VII.

June 19, 1878—7:25 a. m.

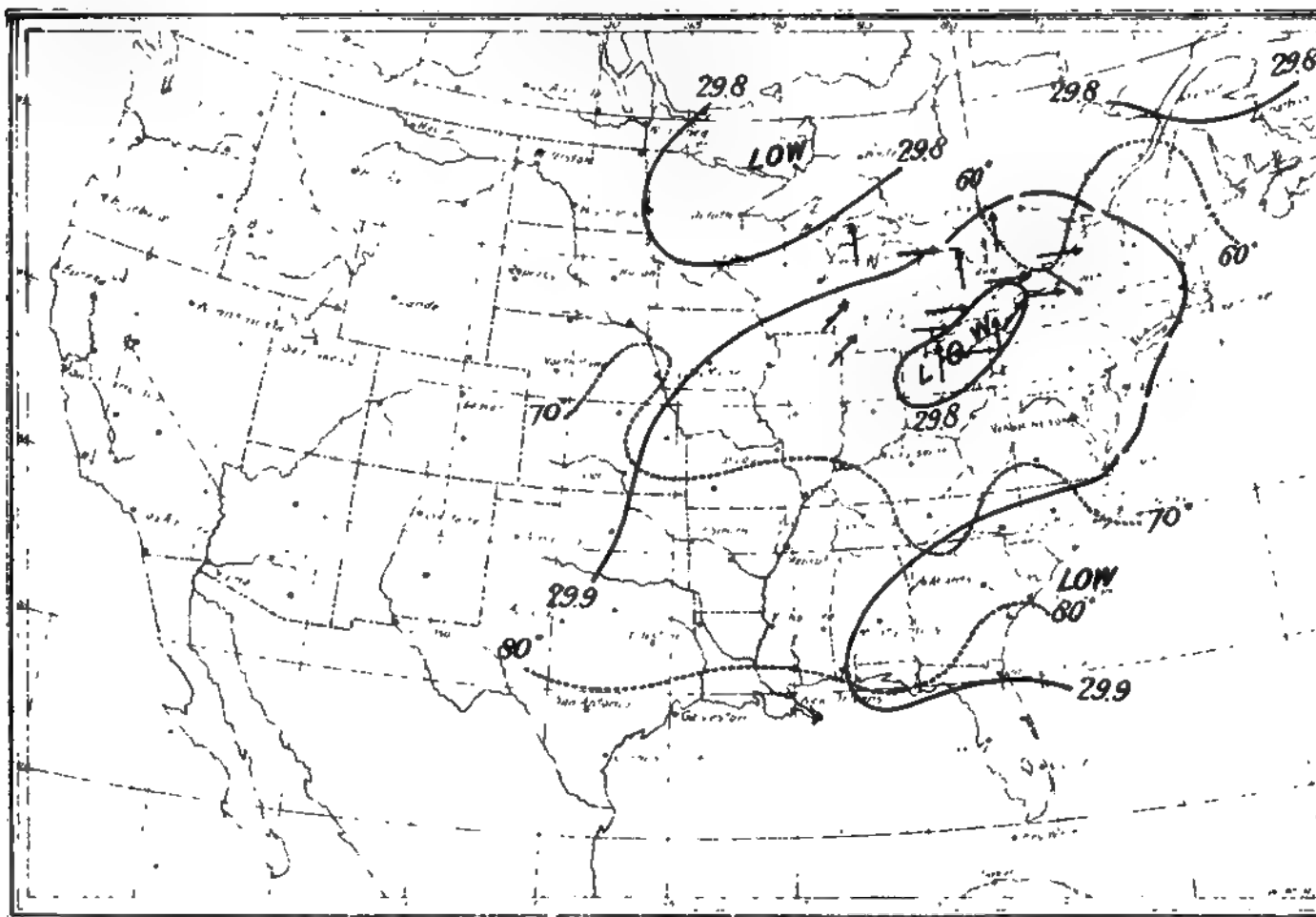
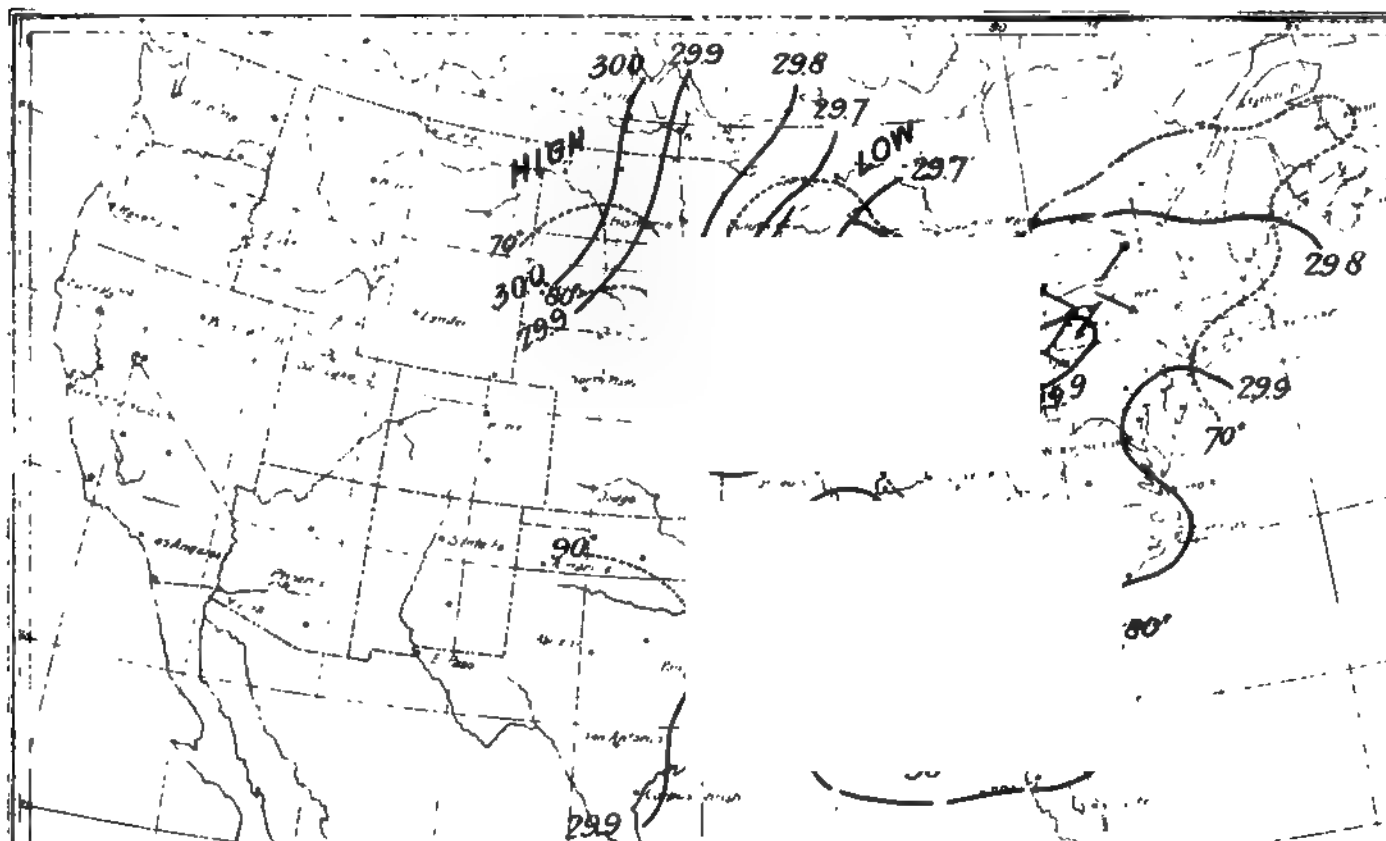
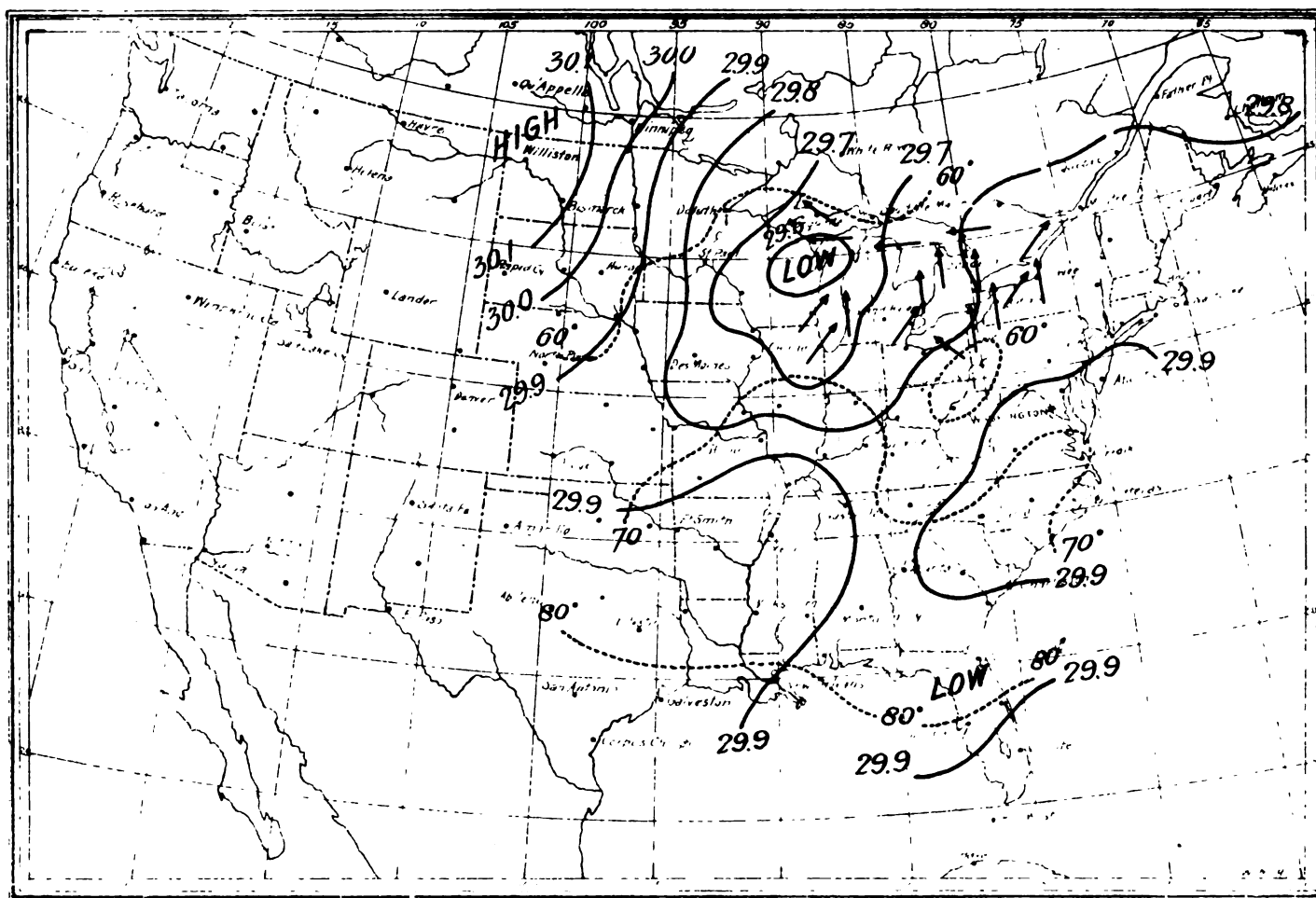


Chart COOL.VIII.

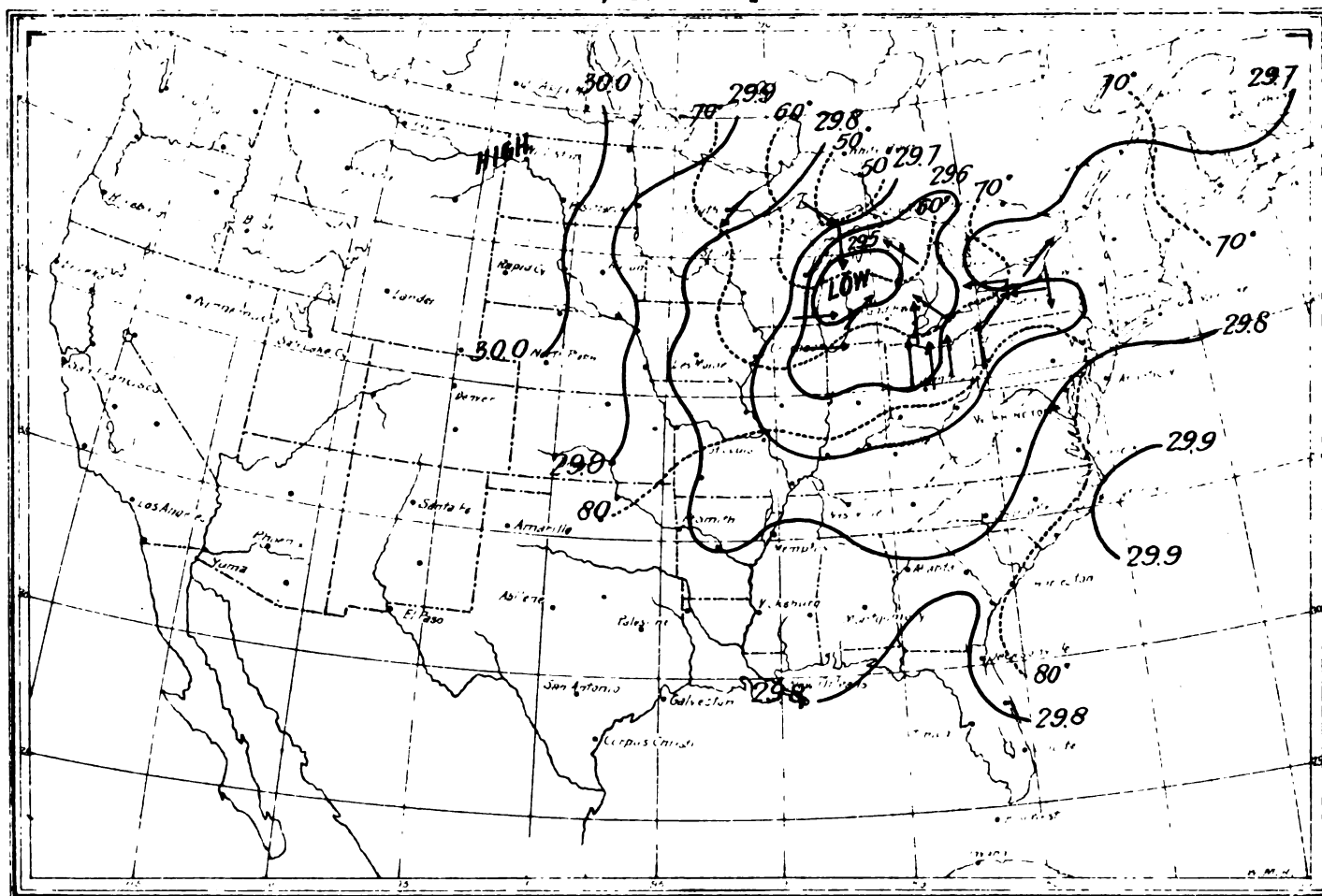
June 19, 1878—4:35 p. m.



June 20, 1878—7:35 a. m.



June 20, 1878—4:35 p. m.



[illegible]

June 5, 1980—3 p. m.

Chart COOLXIII.

June 6, 1880—7 a. m.

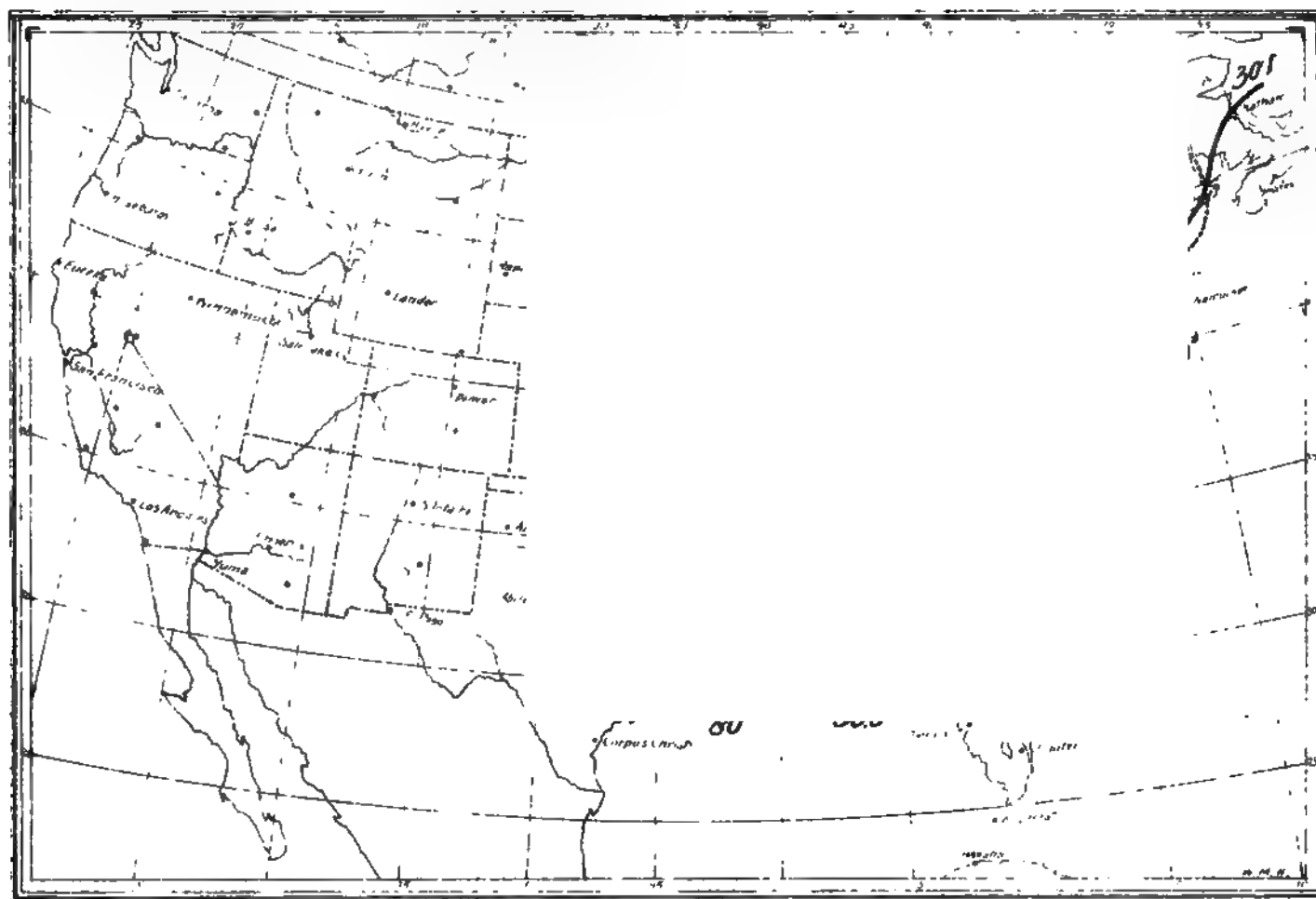
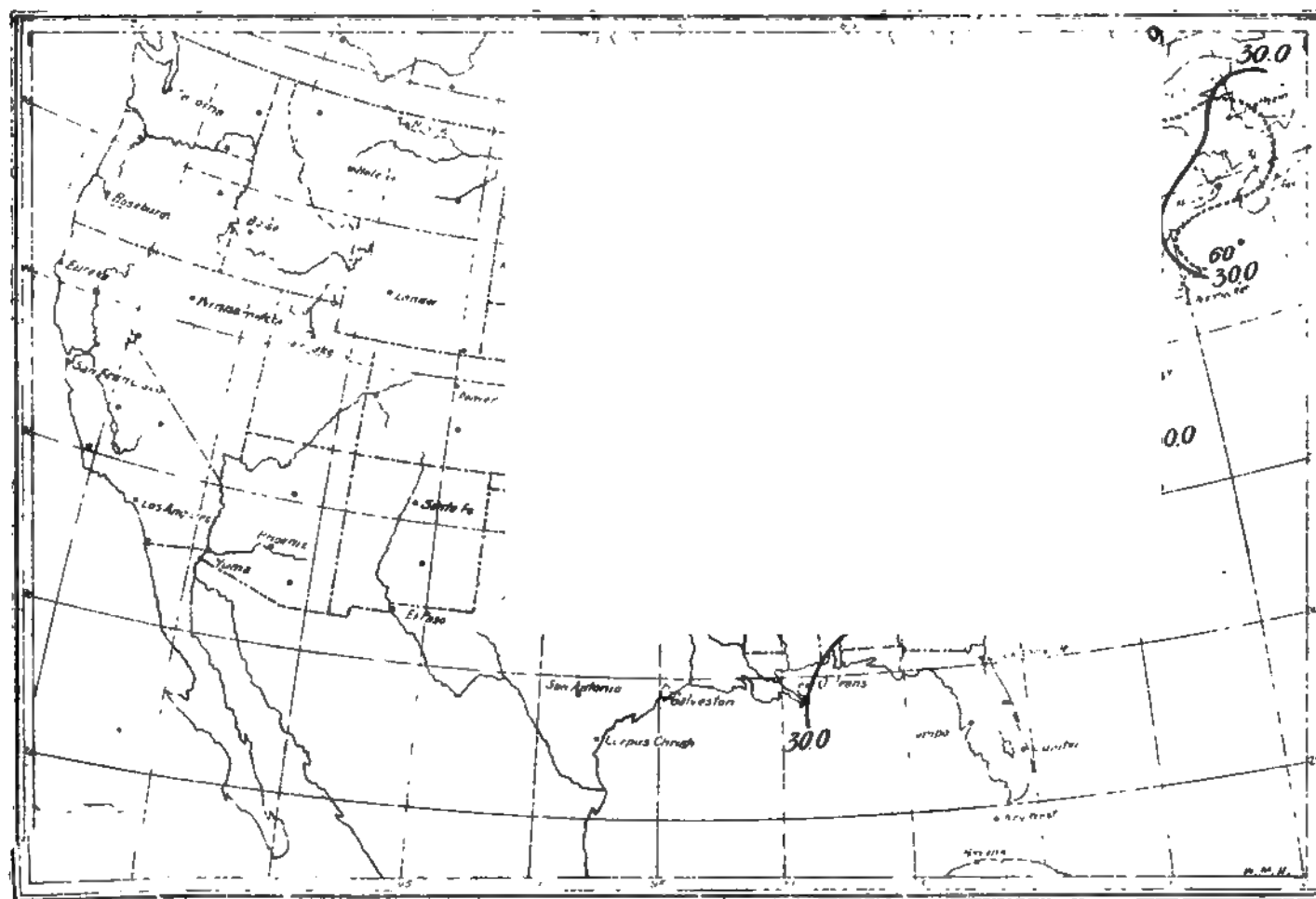


Chart COOLXIV.

June 6, 1880—3 p. m.



June 2, 1882--7 a. m.

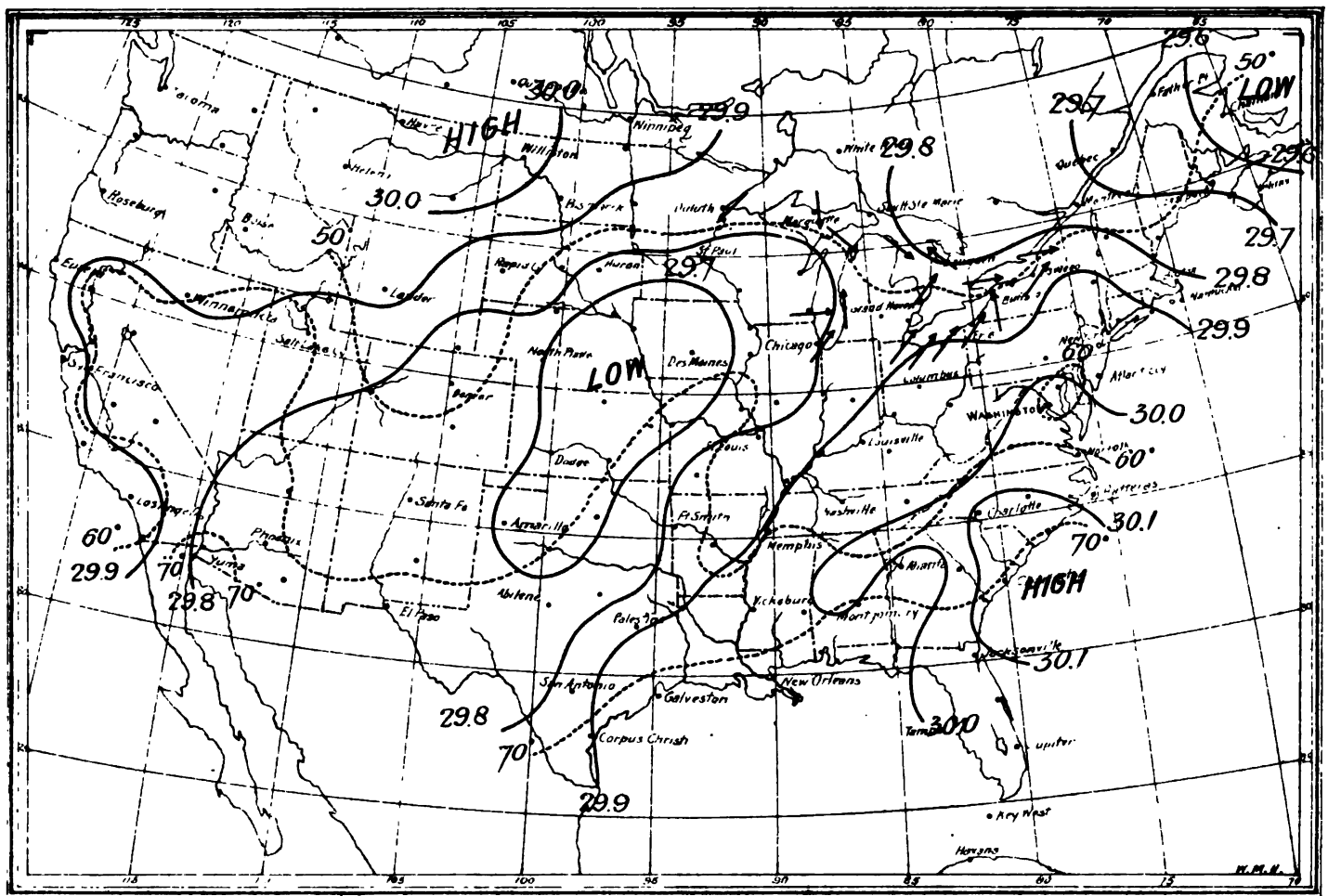
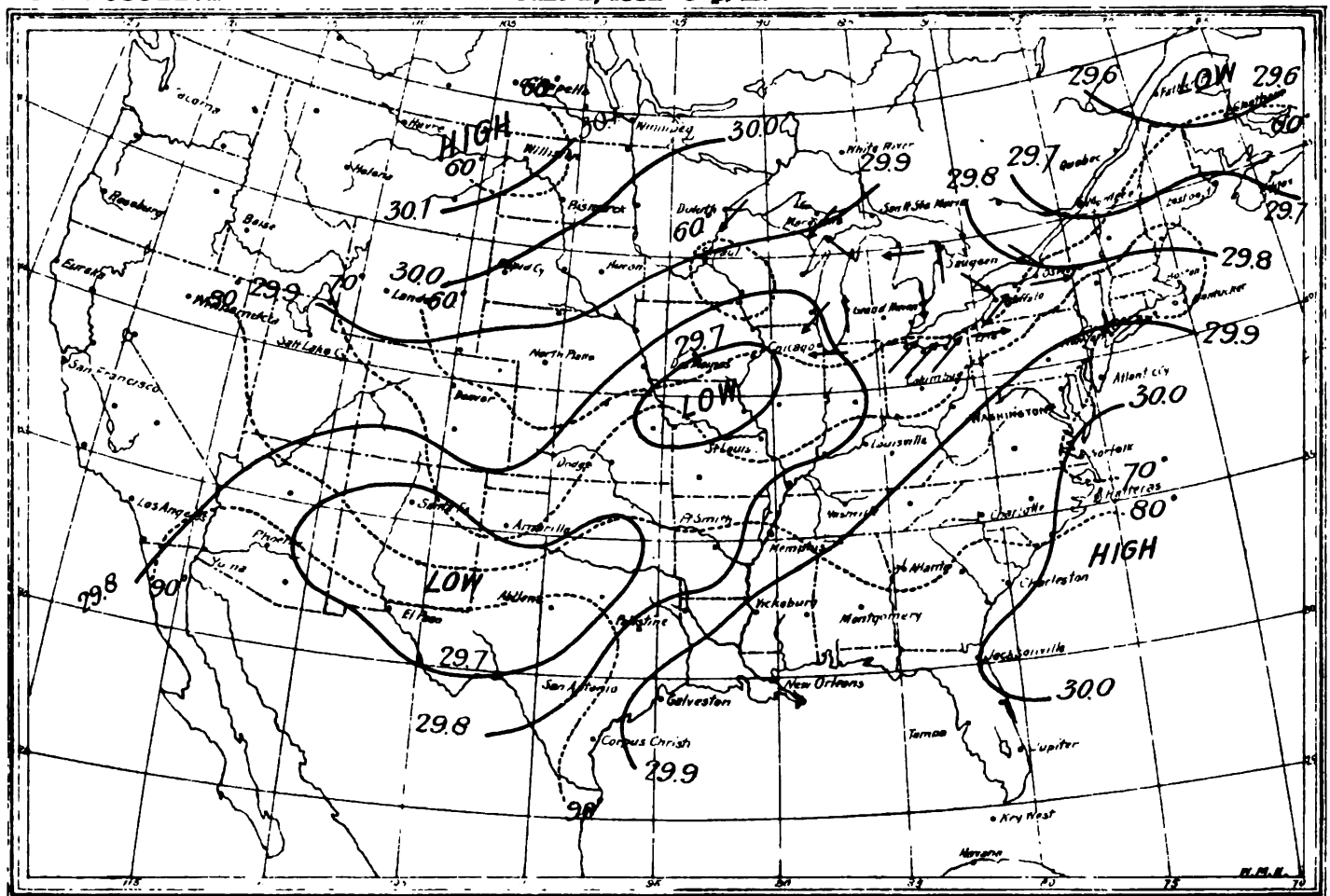
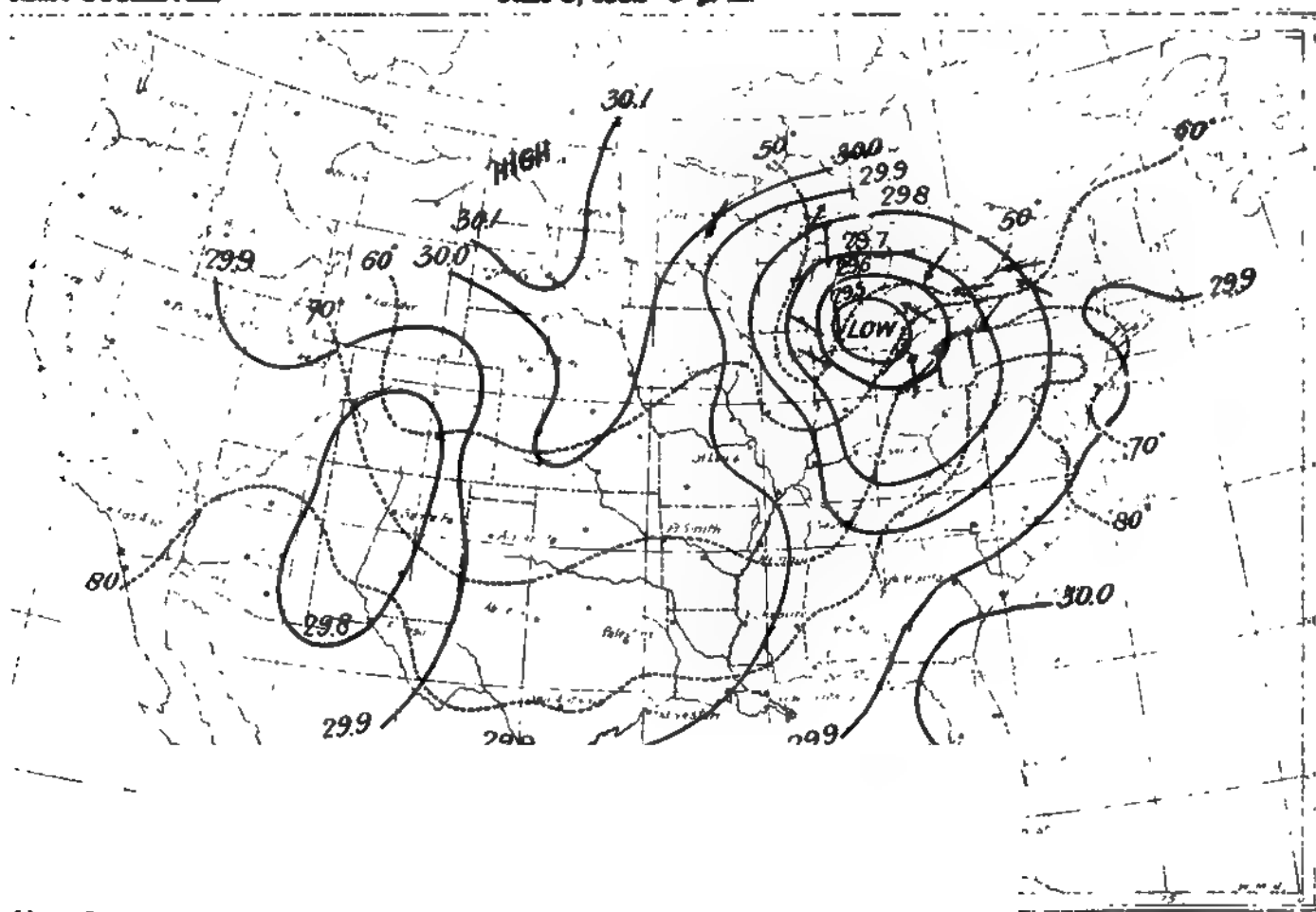
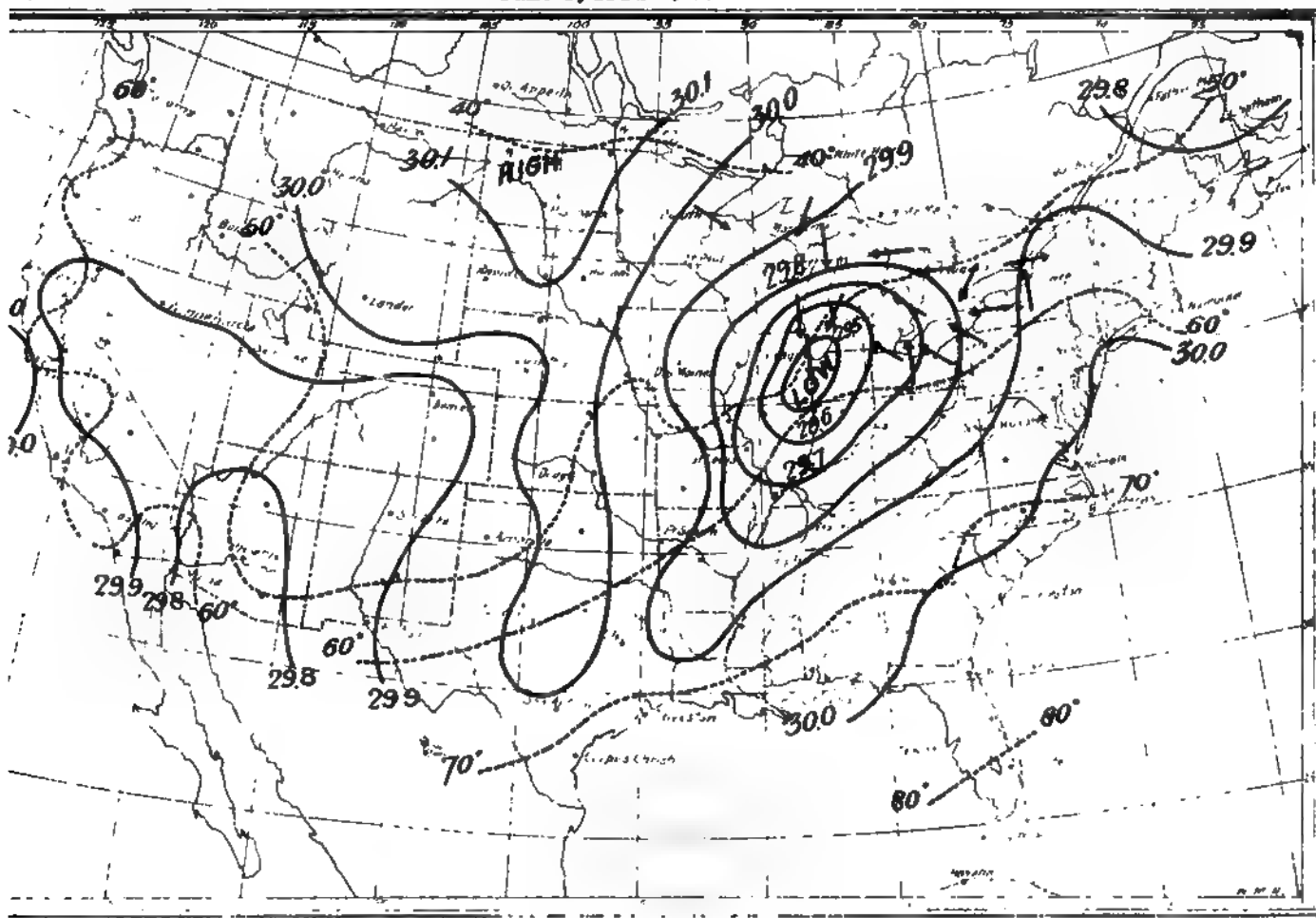


Chart COOLXVI.

June 2, 1882--8 p. m.





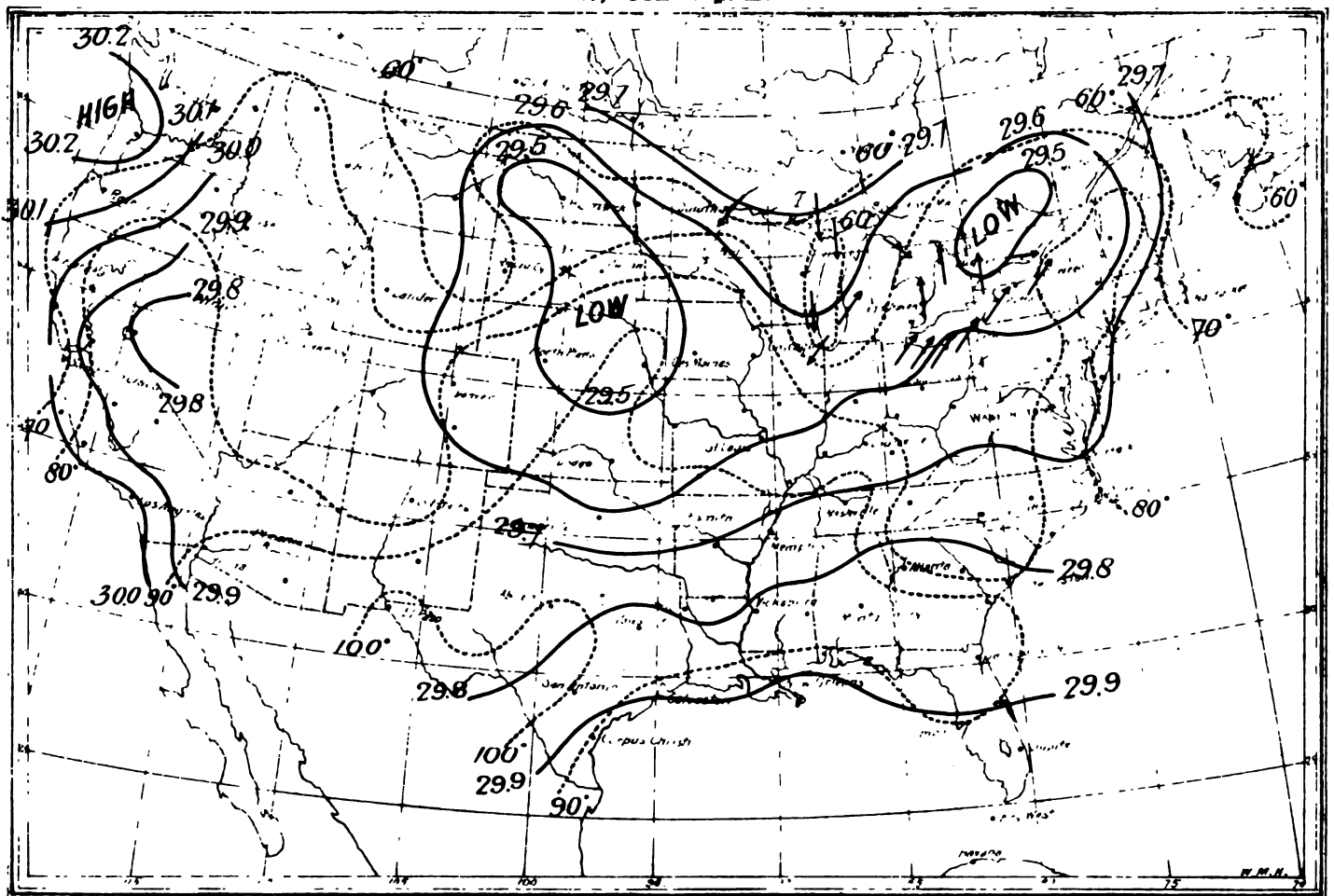
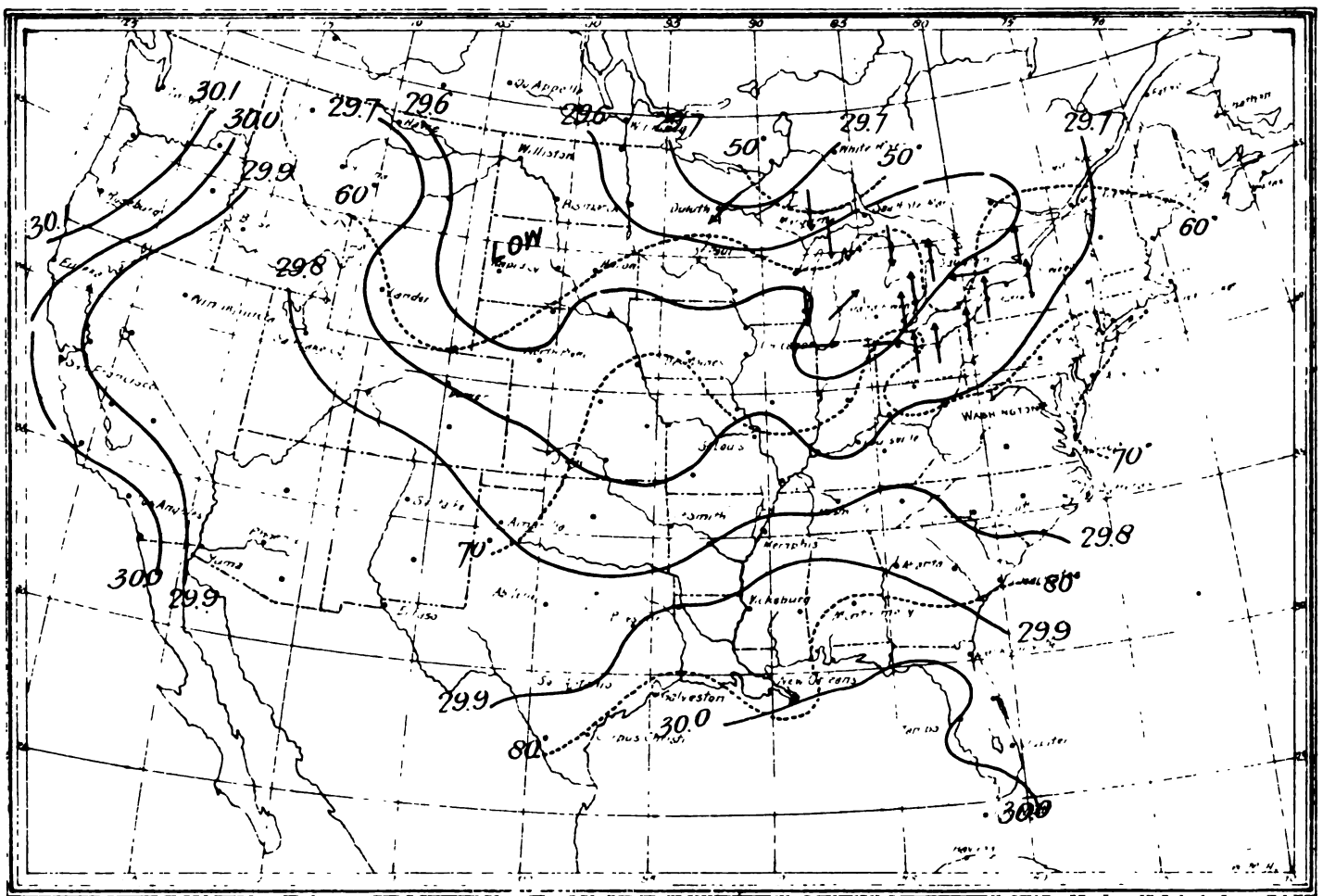


Chart 000LXXI.

June 18, 1882-7 a. m.

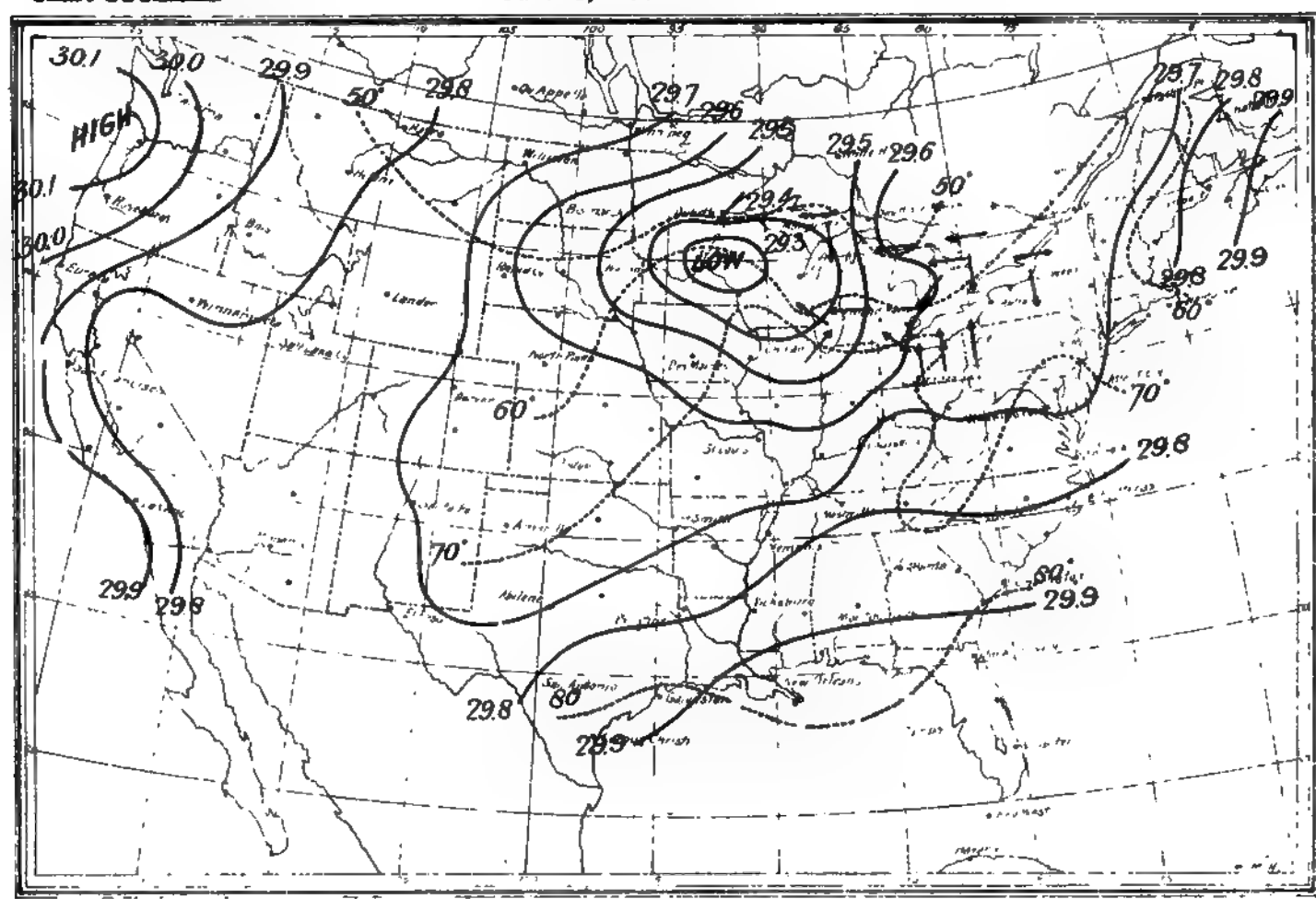
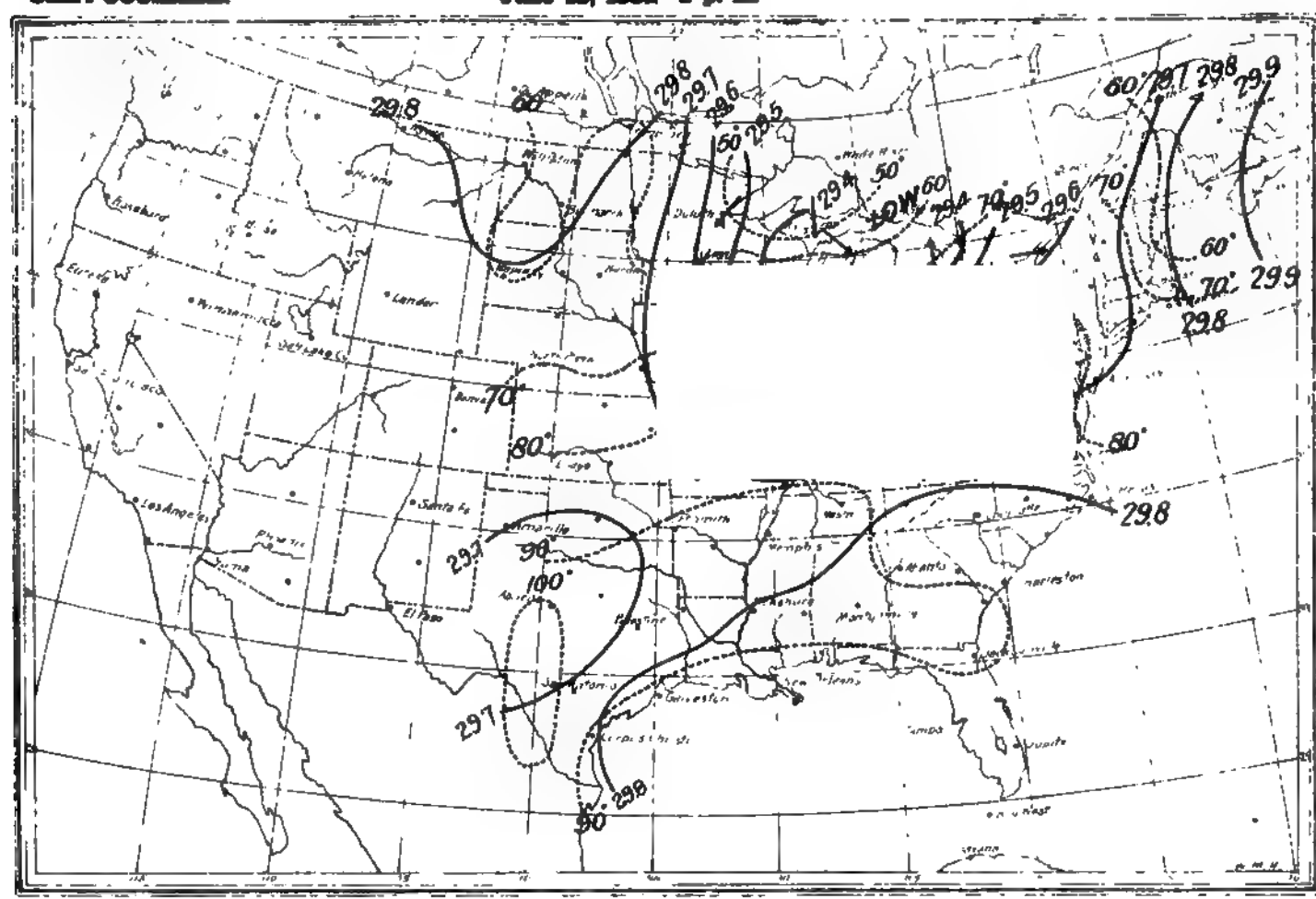
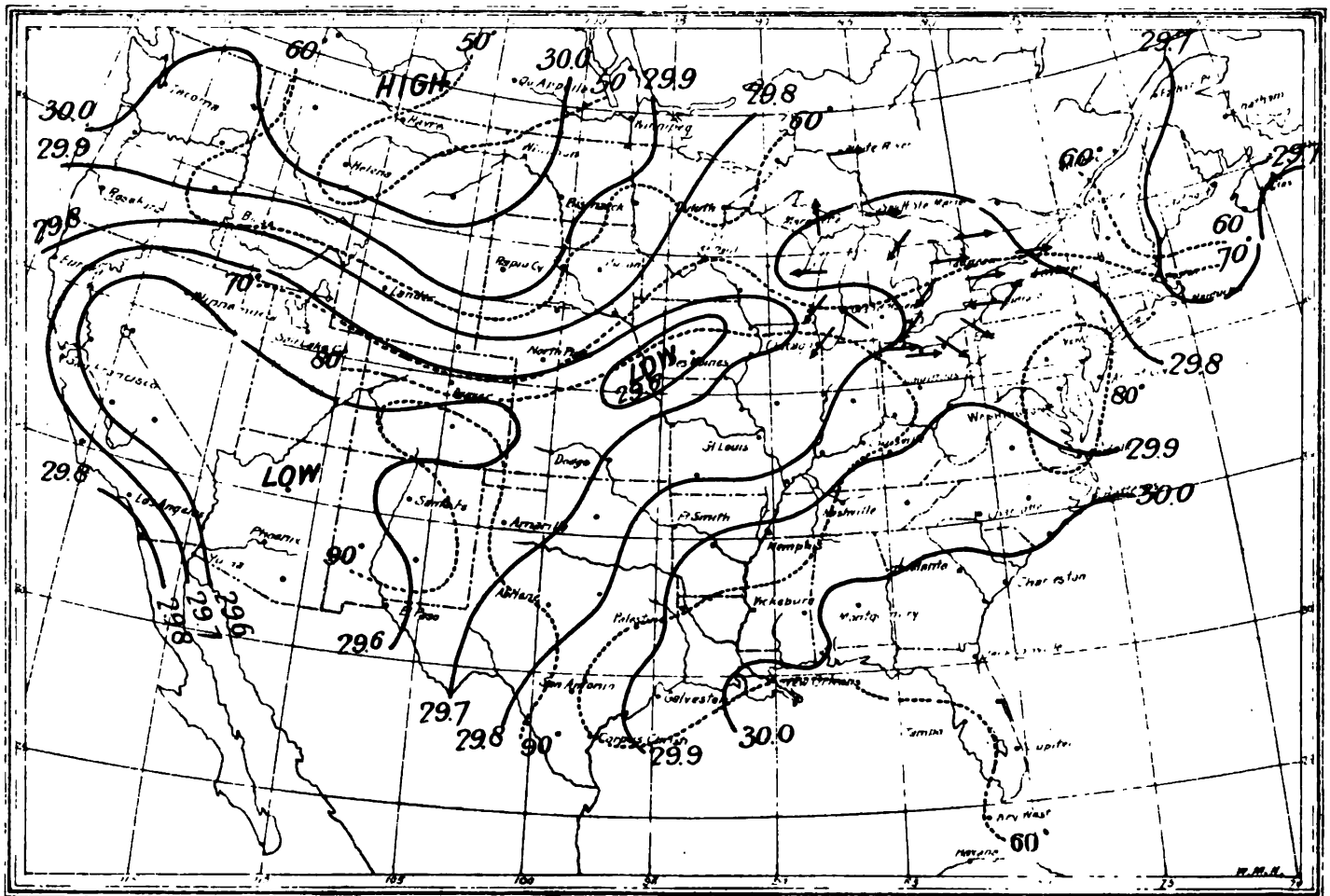
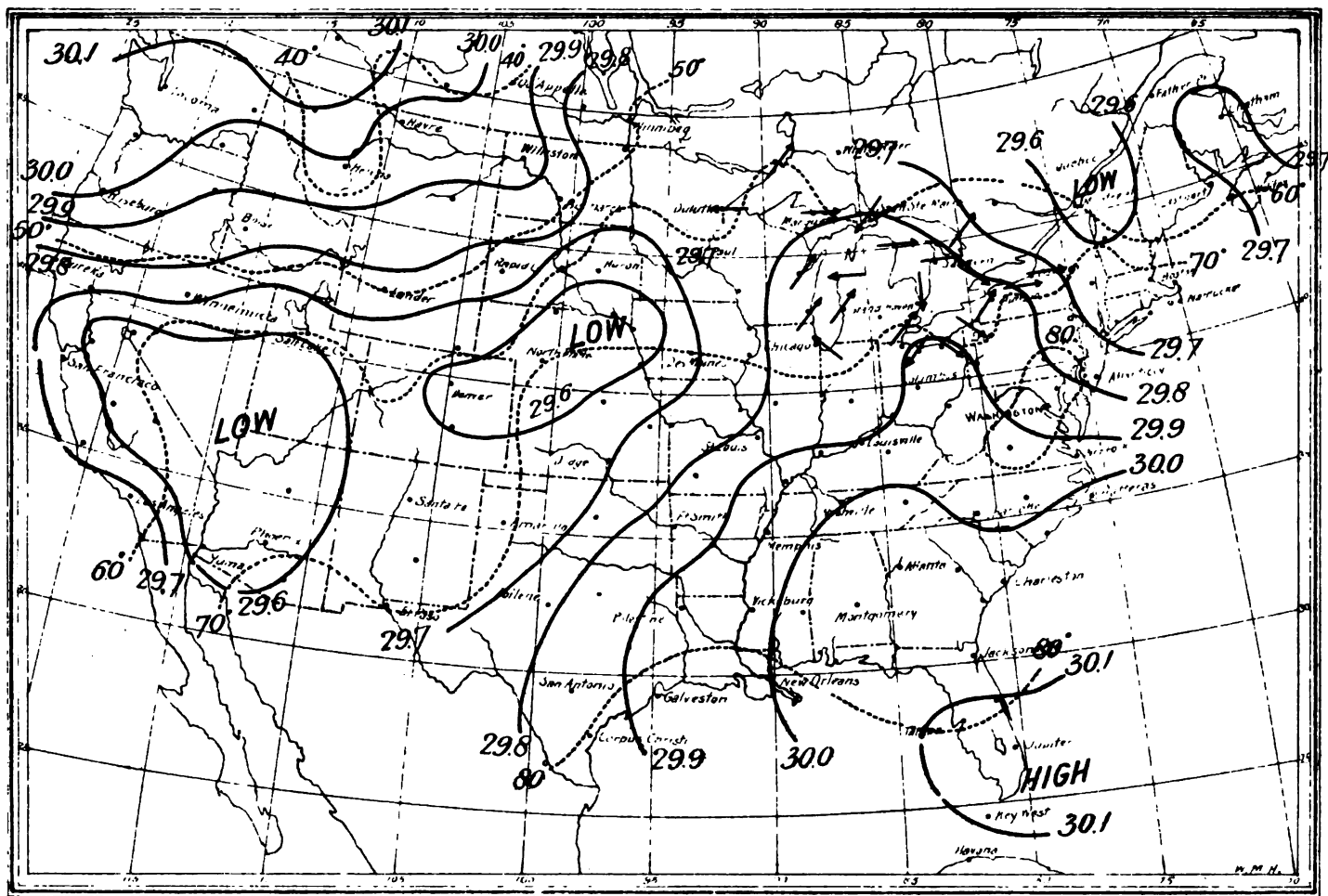


Chart 000LXXII.

June 18, 1882-8 p. m.





June 23, 1892—8 a. m.

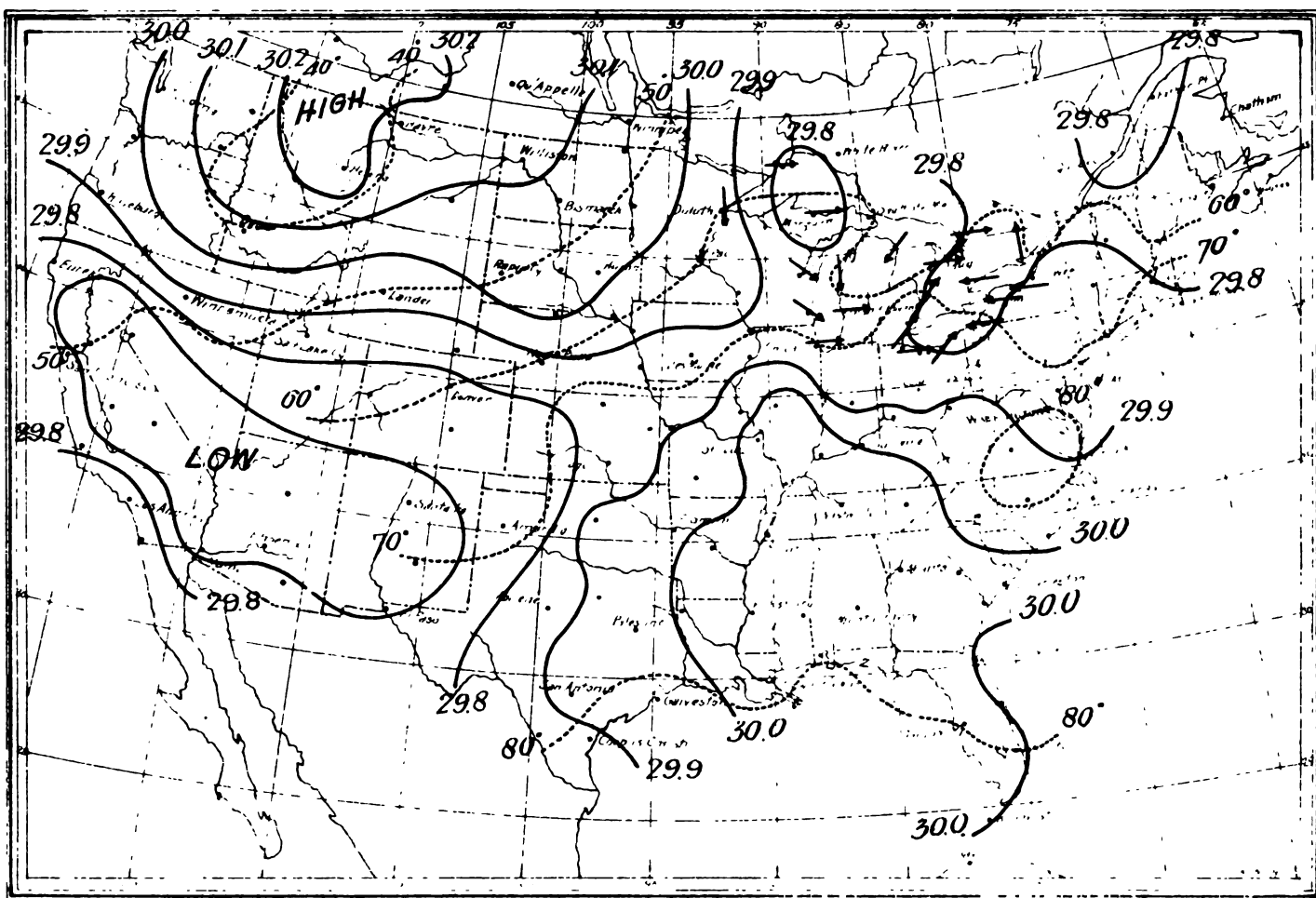


Chart COOLXXVI.

June 23, 1892—8 p. m.

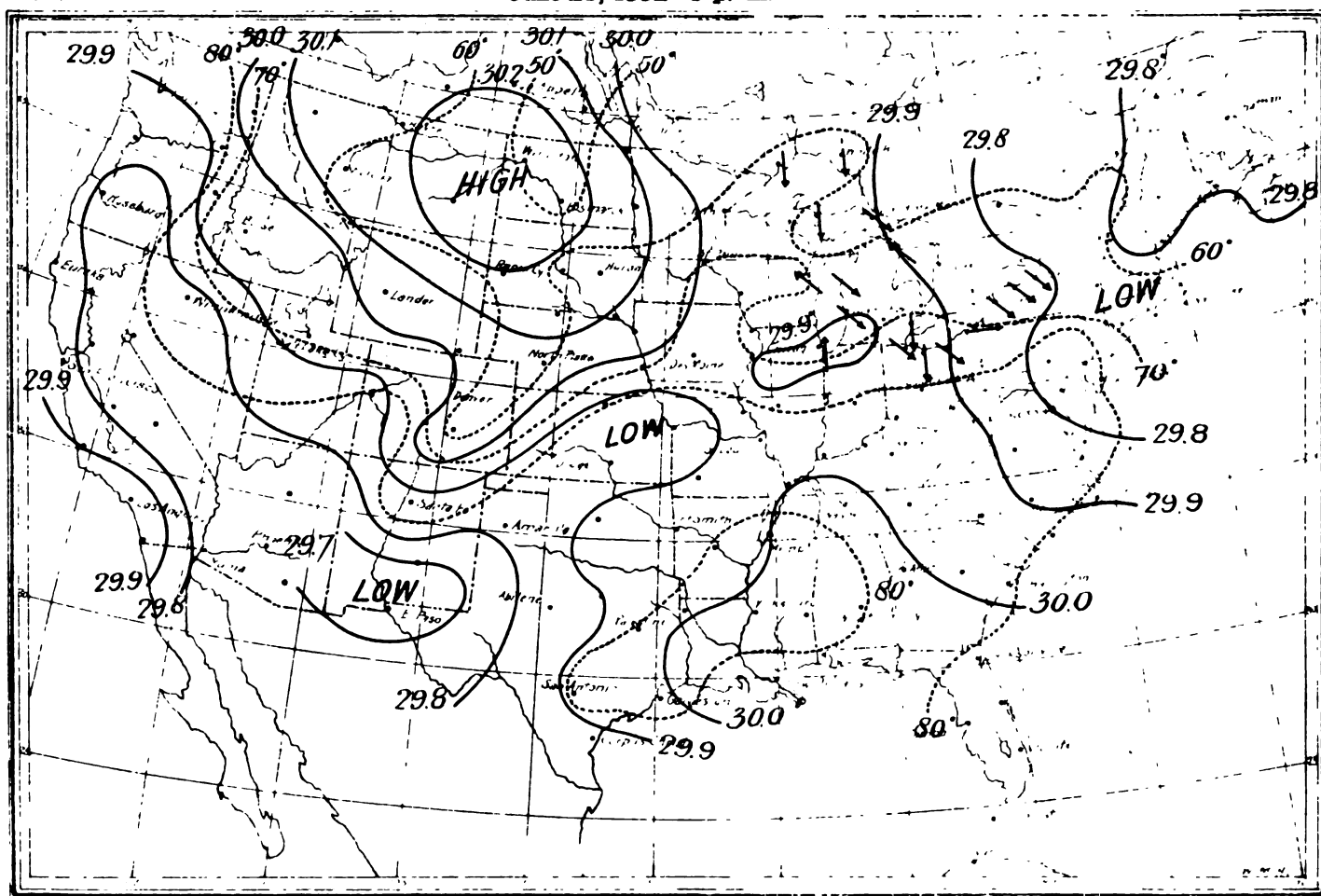


Chart COOLXXVII.

June 20, 1893—8 a. m.

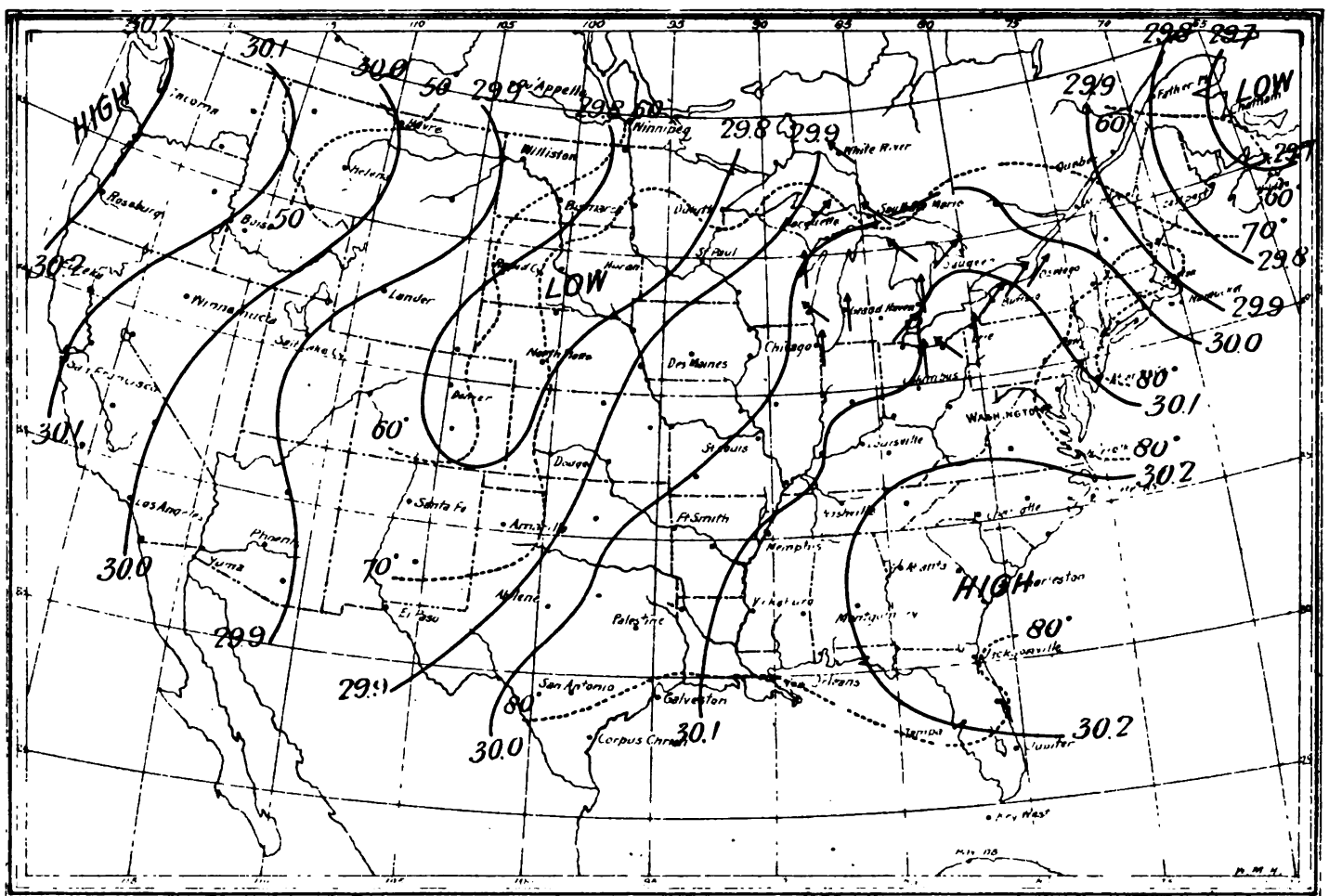


Chart COOLXXVIII.

June 20, 1893—8 p. m.

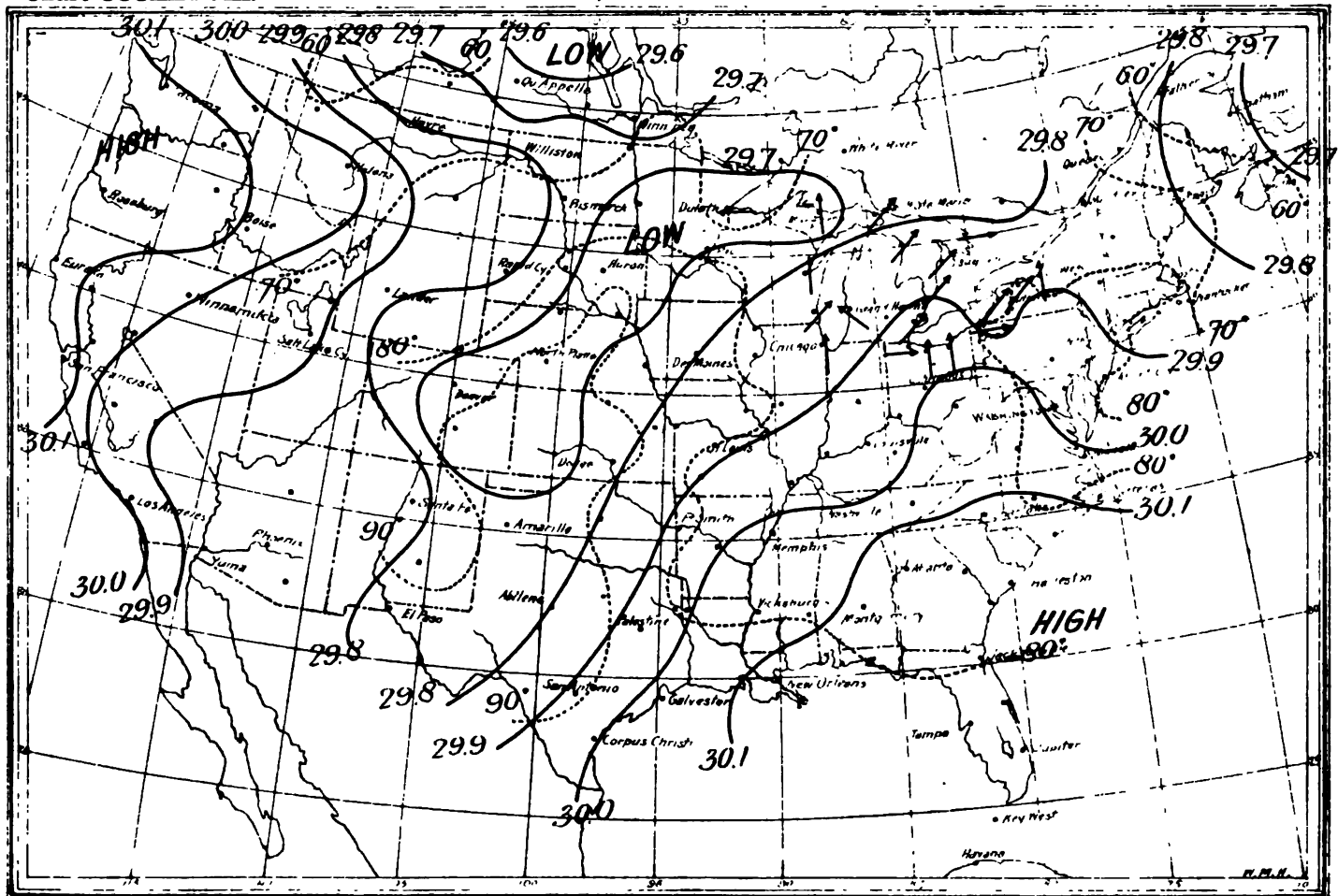


Chart OOOLXXIX.

June 21, 1893—8 a. m.

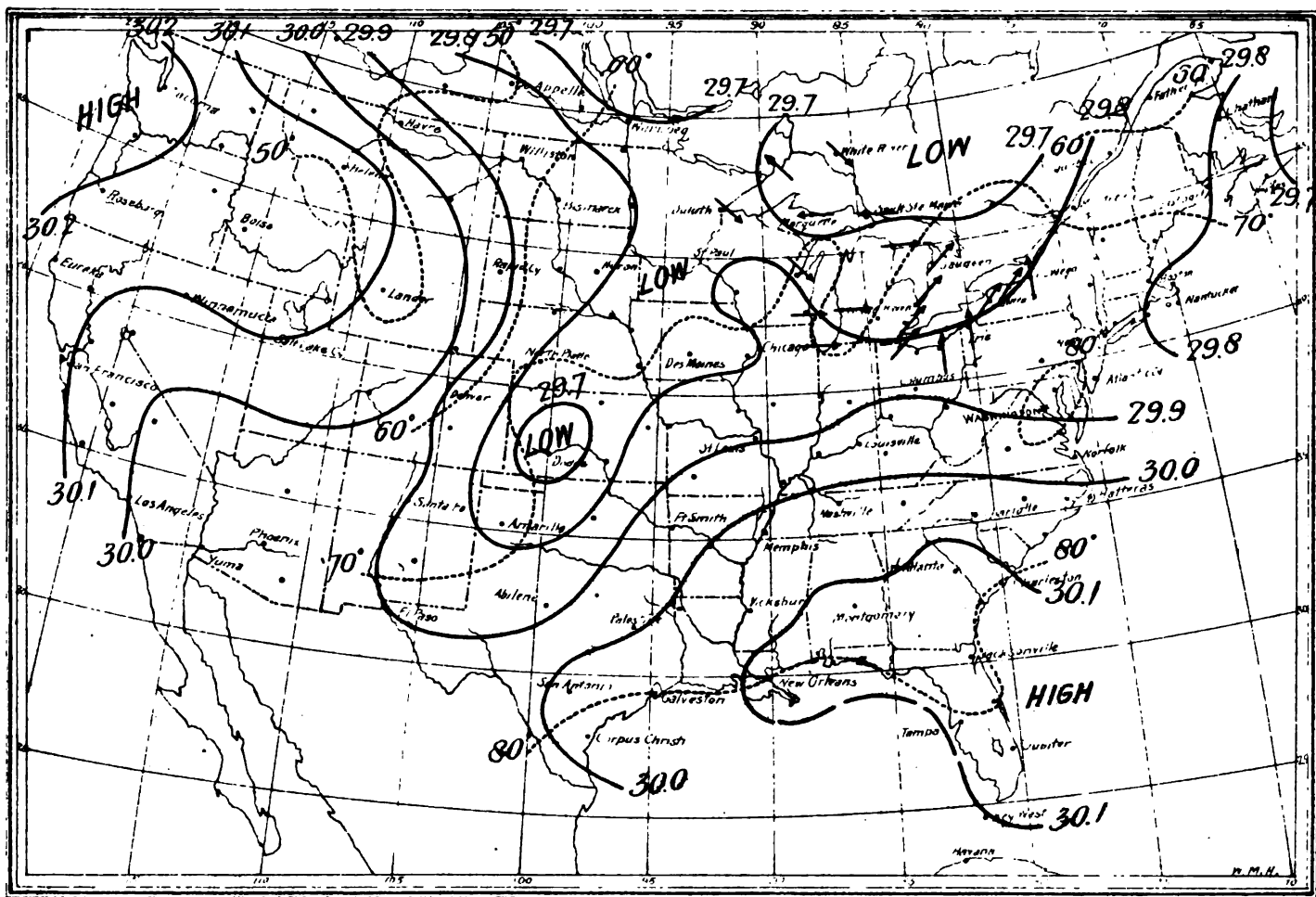


Chart OOOLXXX.

June 21, 1893—8 p. m.

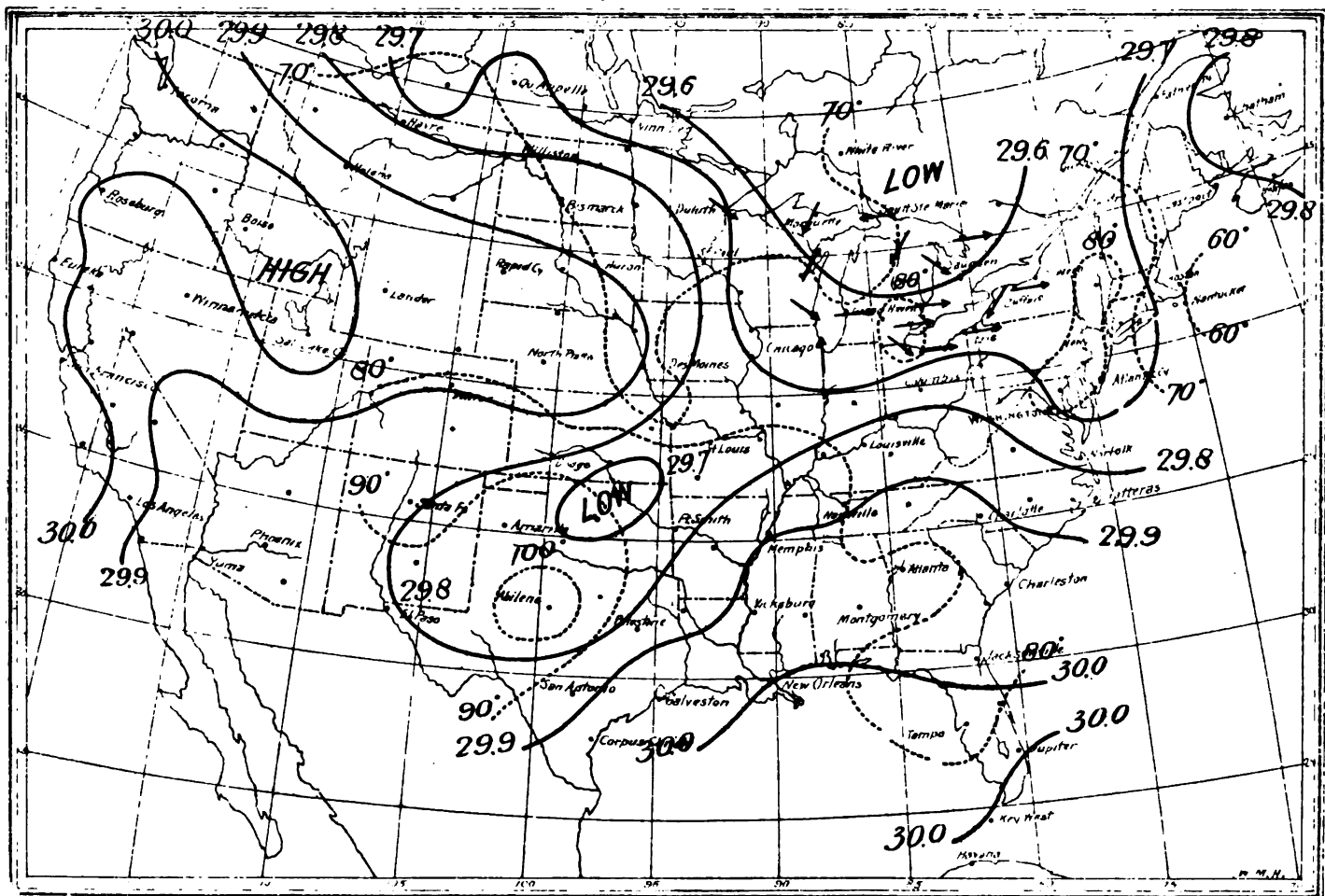


Chart 000LXXXI

June 1, 1897—8 a. m.



Chart 000LXXXII

June 1, 1897—8 p. m.

Chart 000LXXXIII.

June 2, 1897—8 a. m.

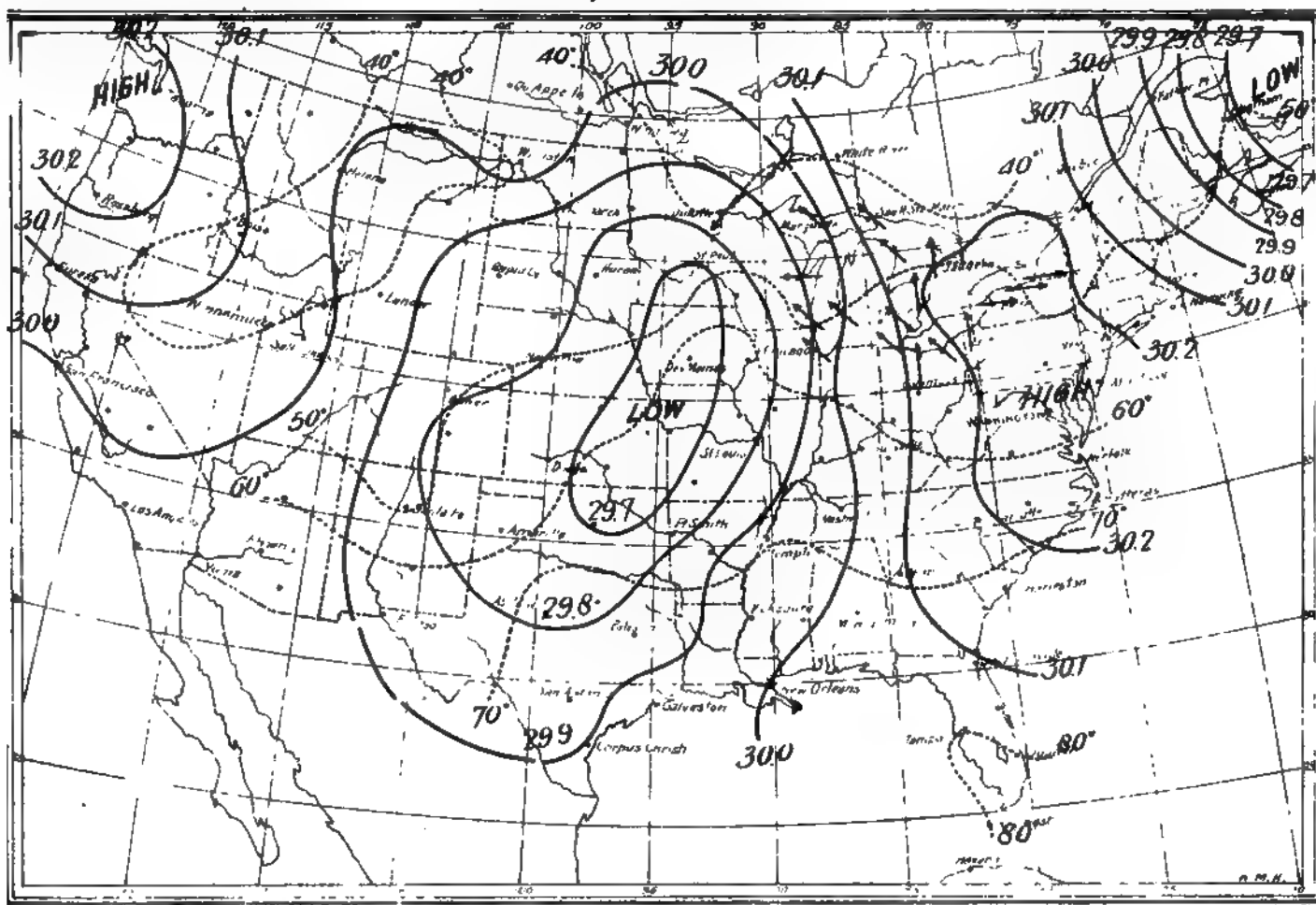
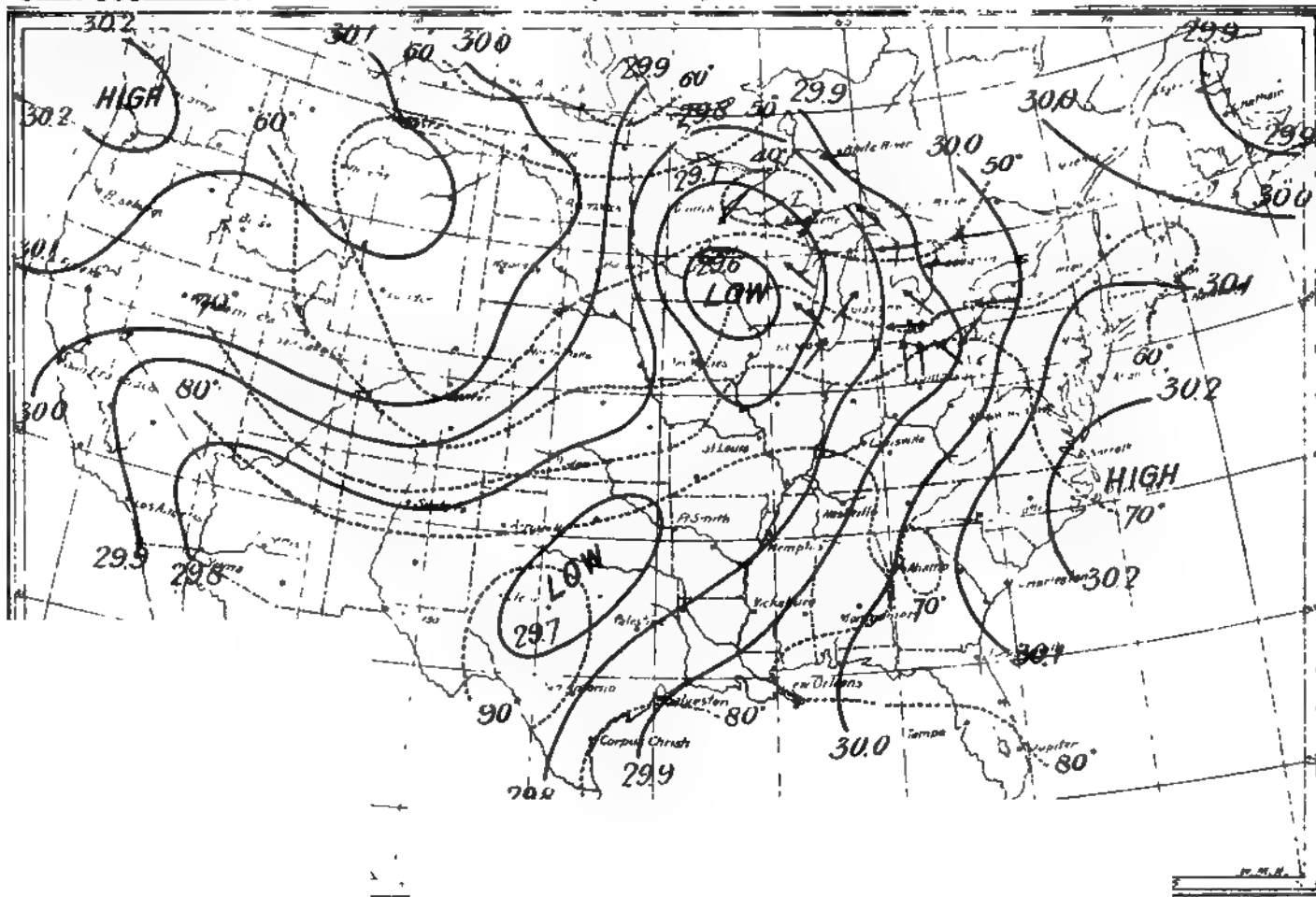
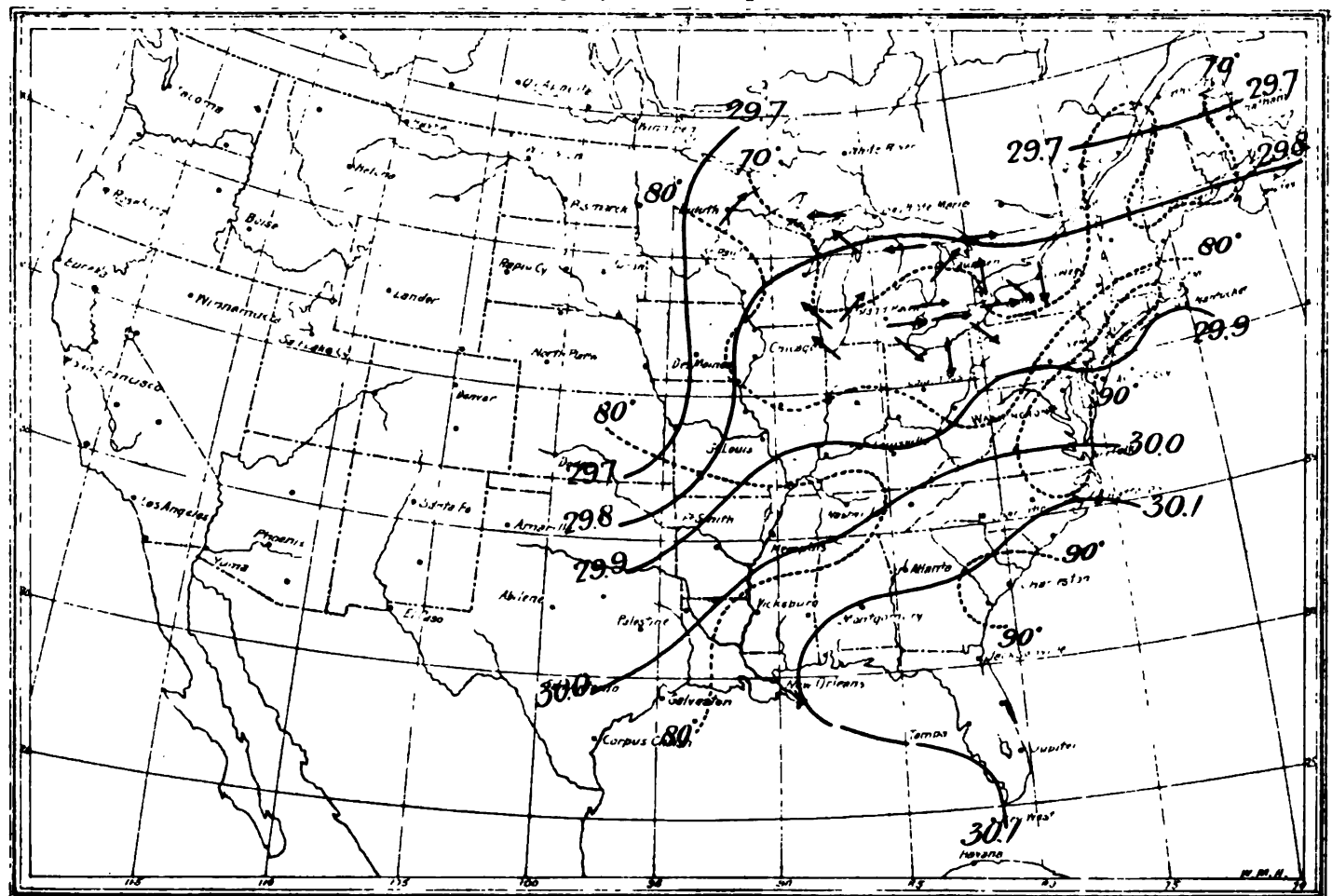
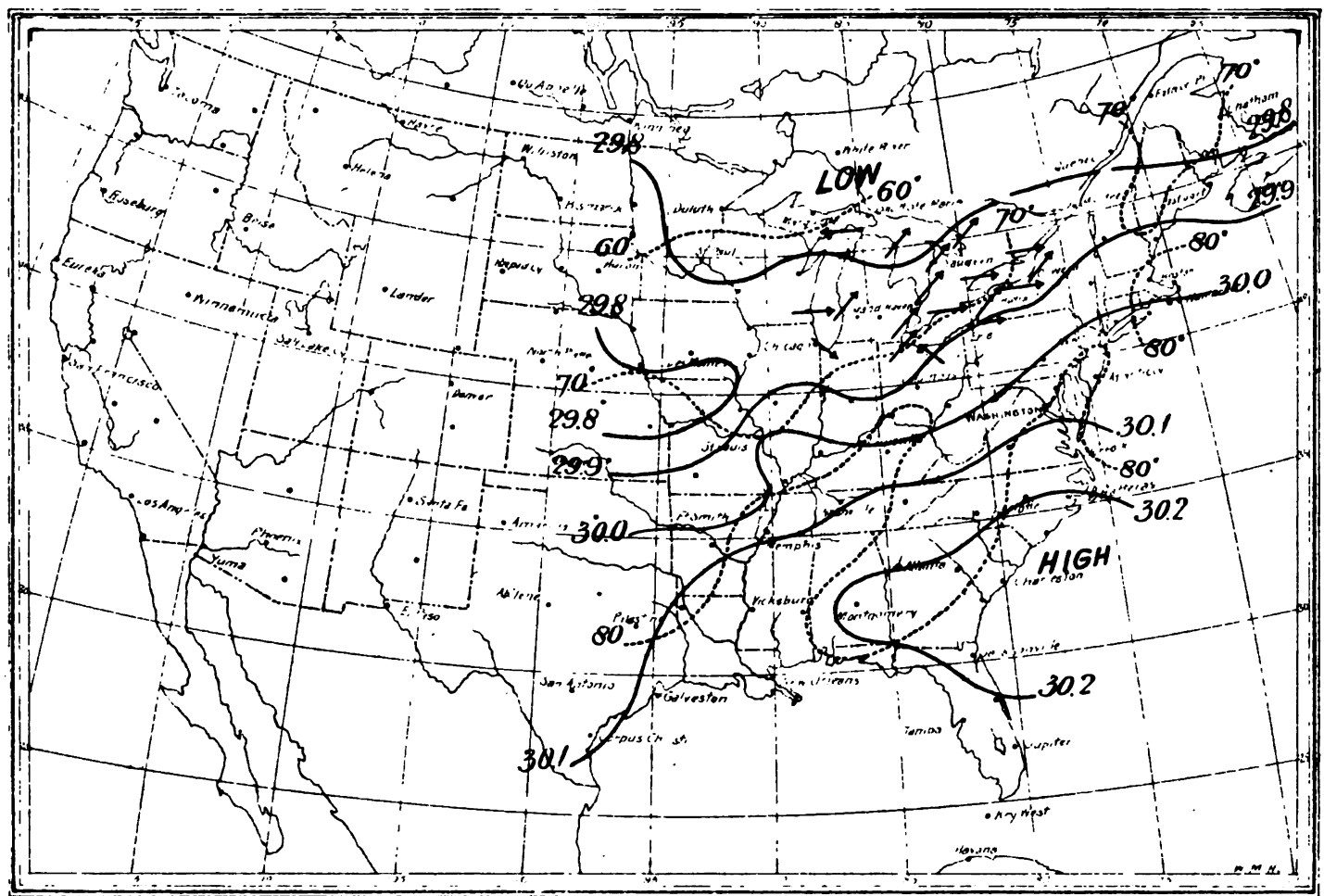
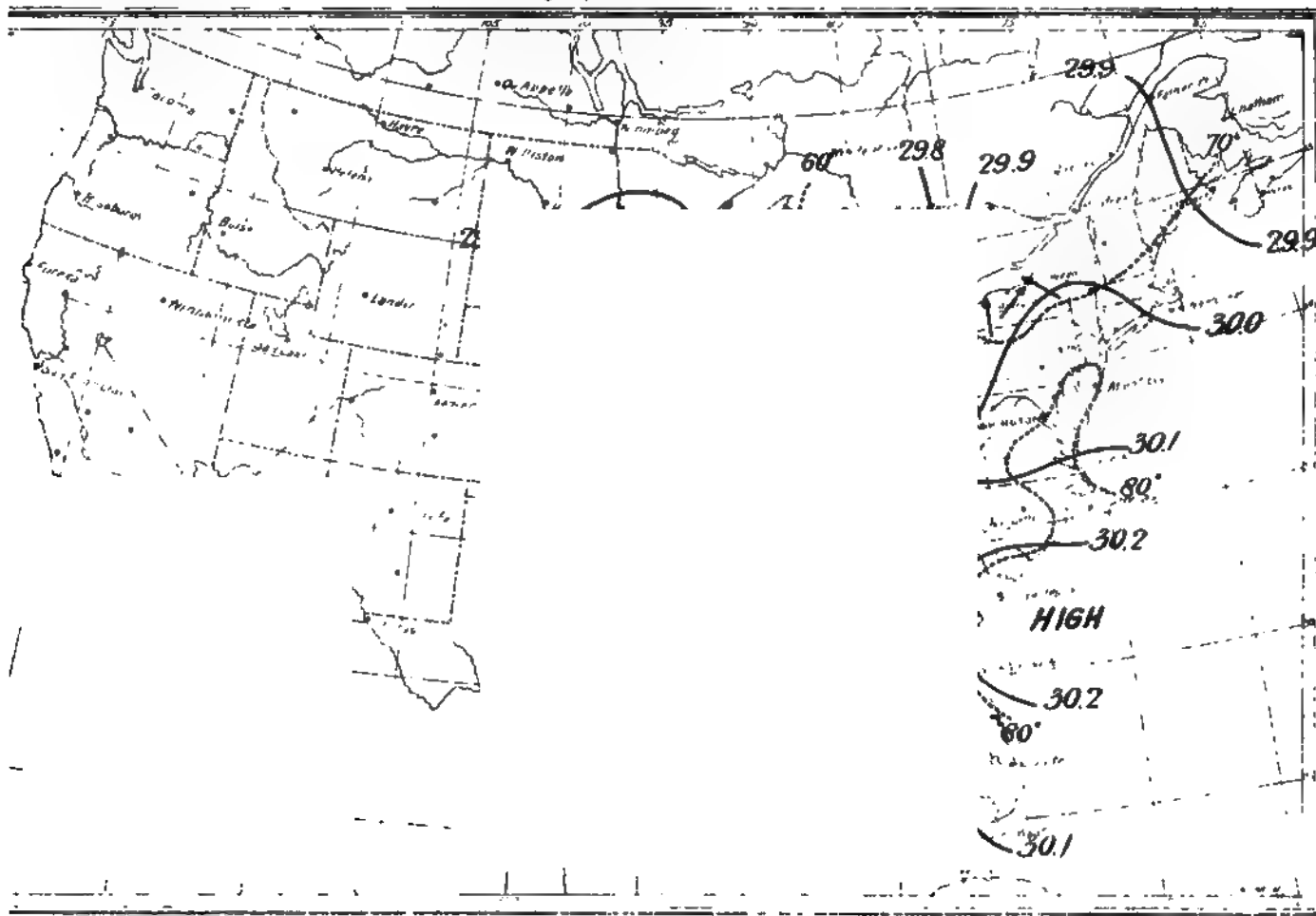


Chart 000LXXXIV.

June 2, 1897—8 p. m.







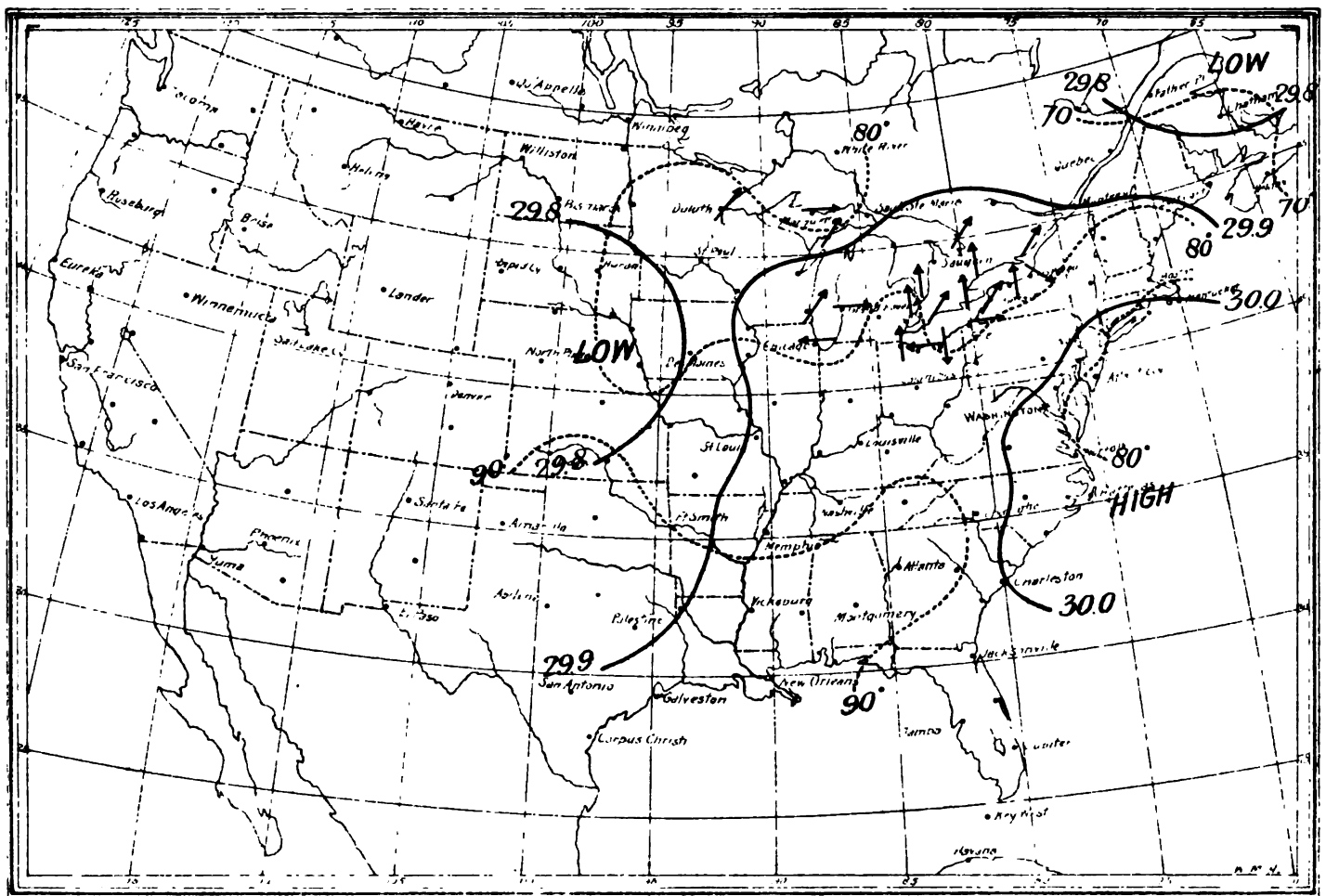
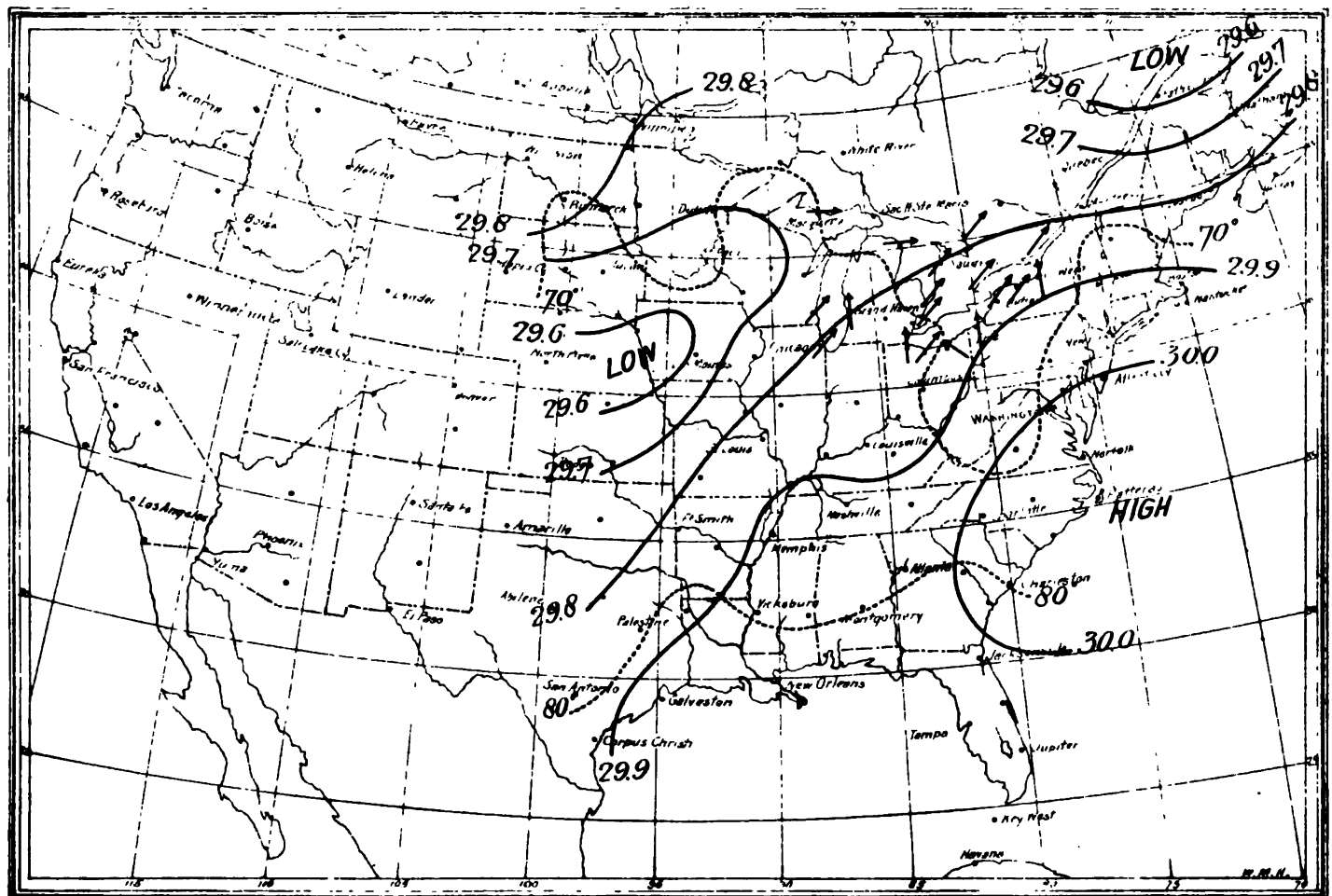
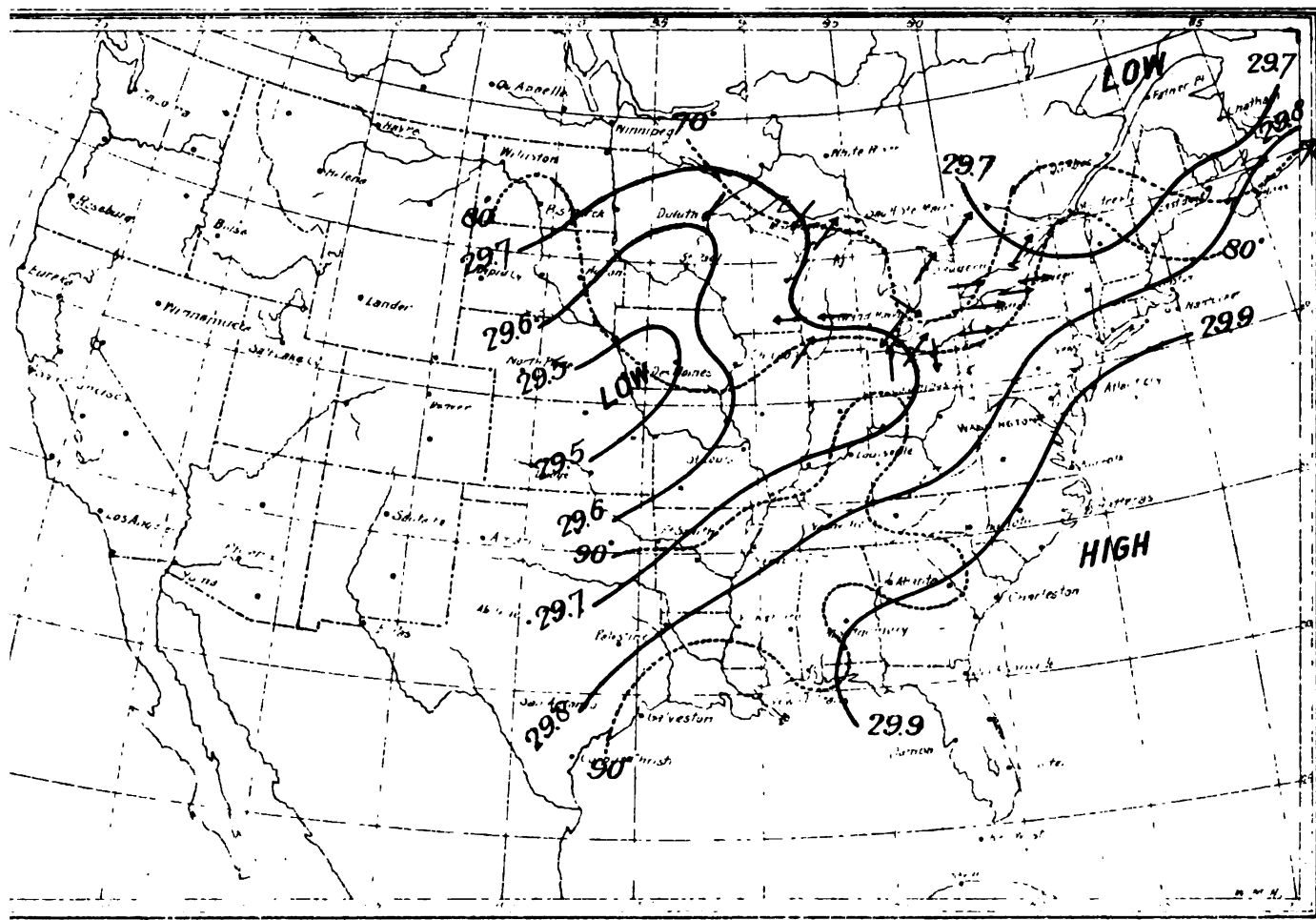


Chart 000XO.

July 25, 1878—7:35 a. m.



July 25, 1878—4:35 p. m.



July 26, 1878—7:35 a. m.

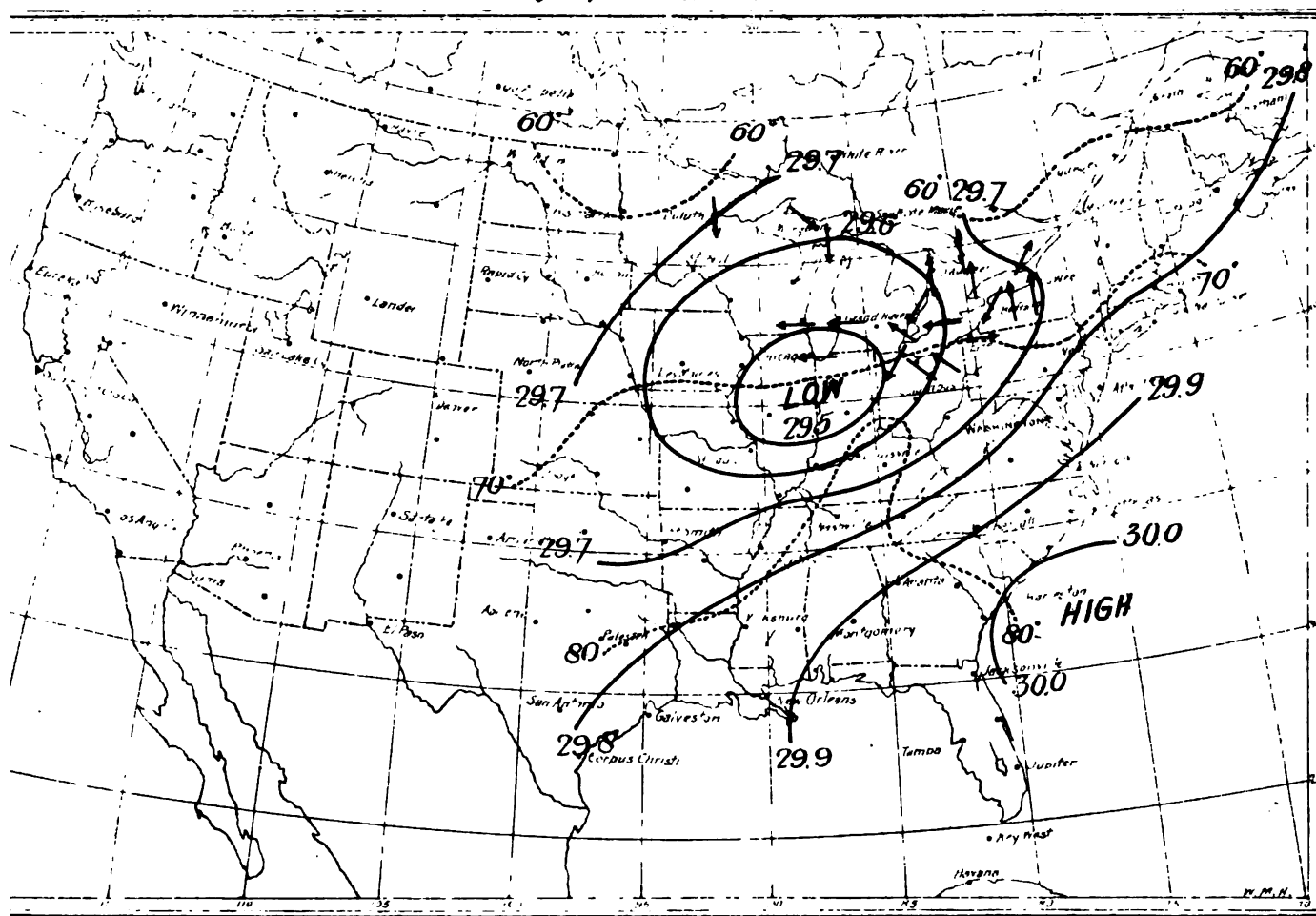


Chart OOOXOIII.

July 15, 1885-3 p. m.

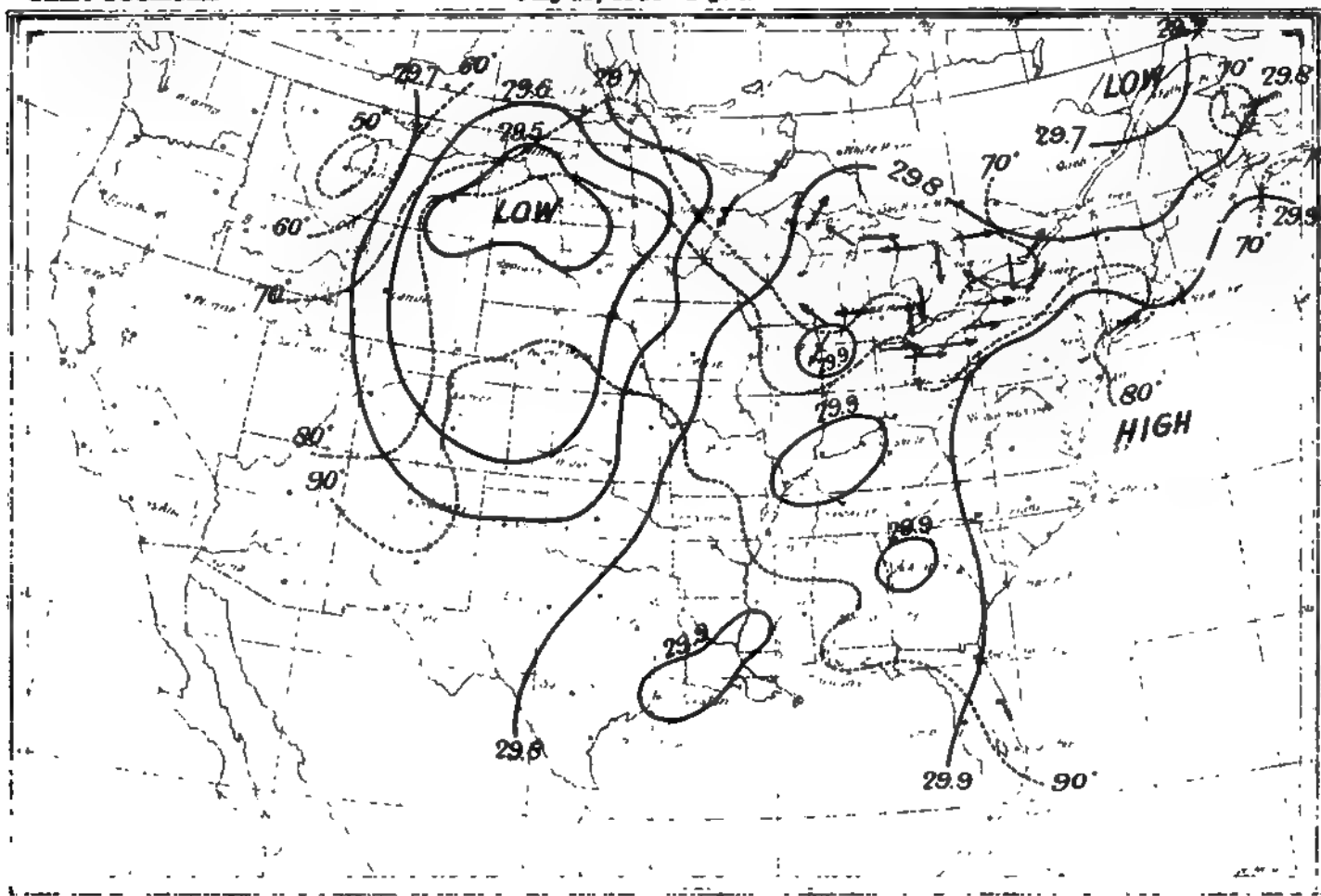
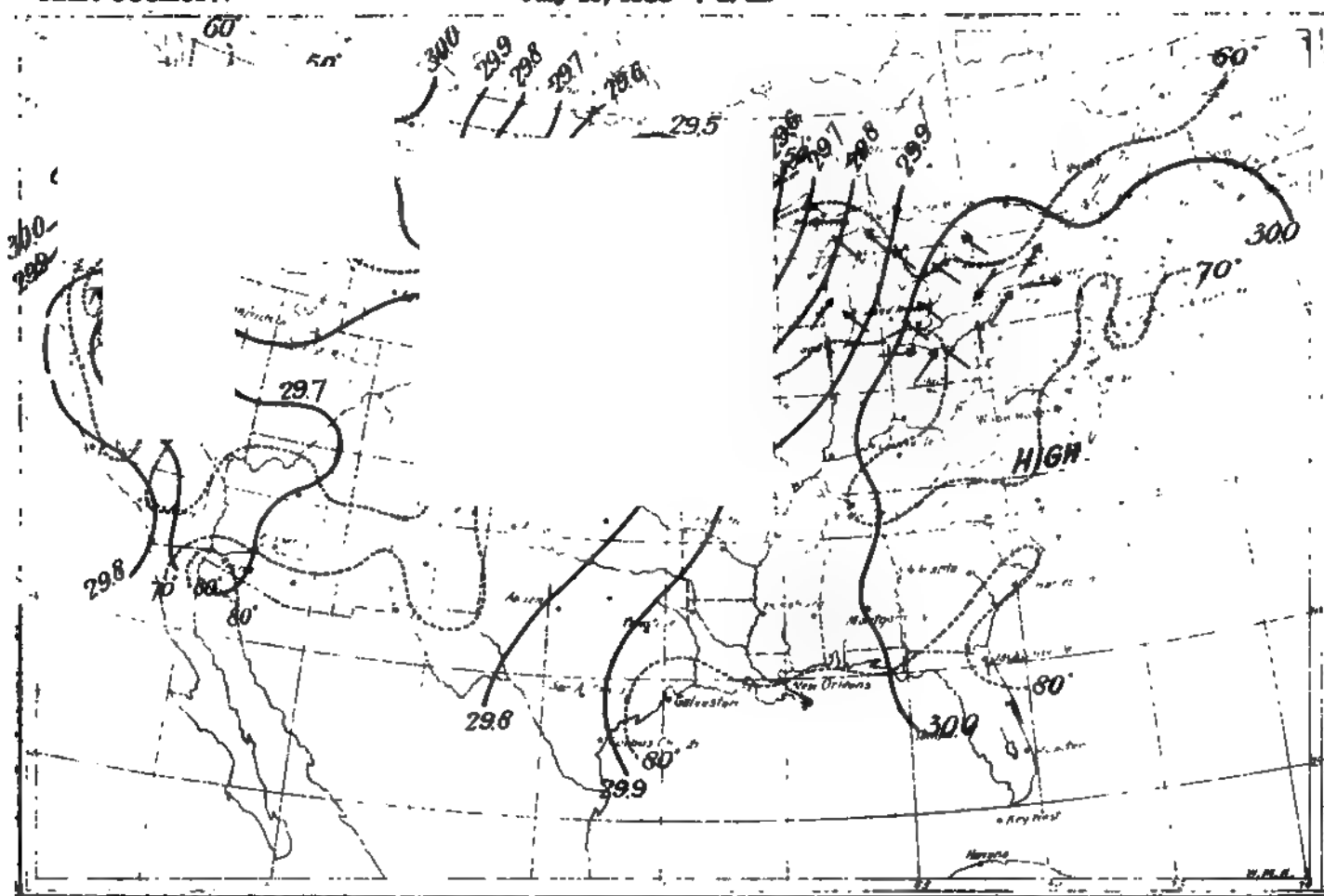


Chart OOOXOIV.

July 16, 1885-7 a. m.



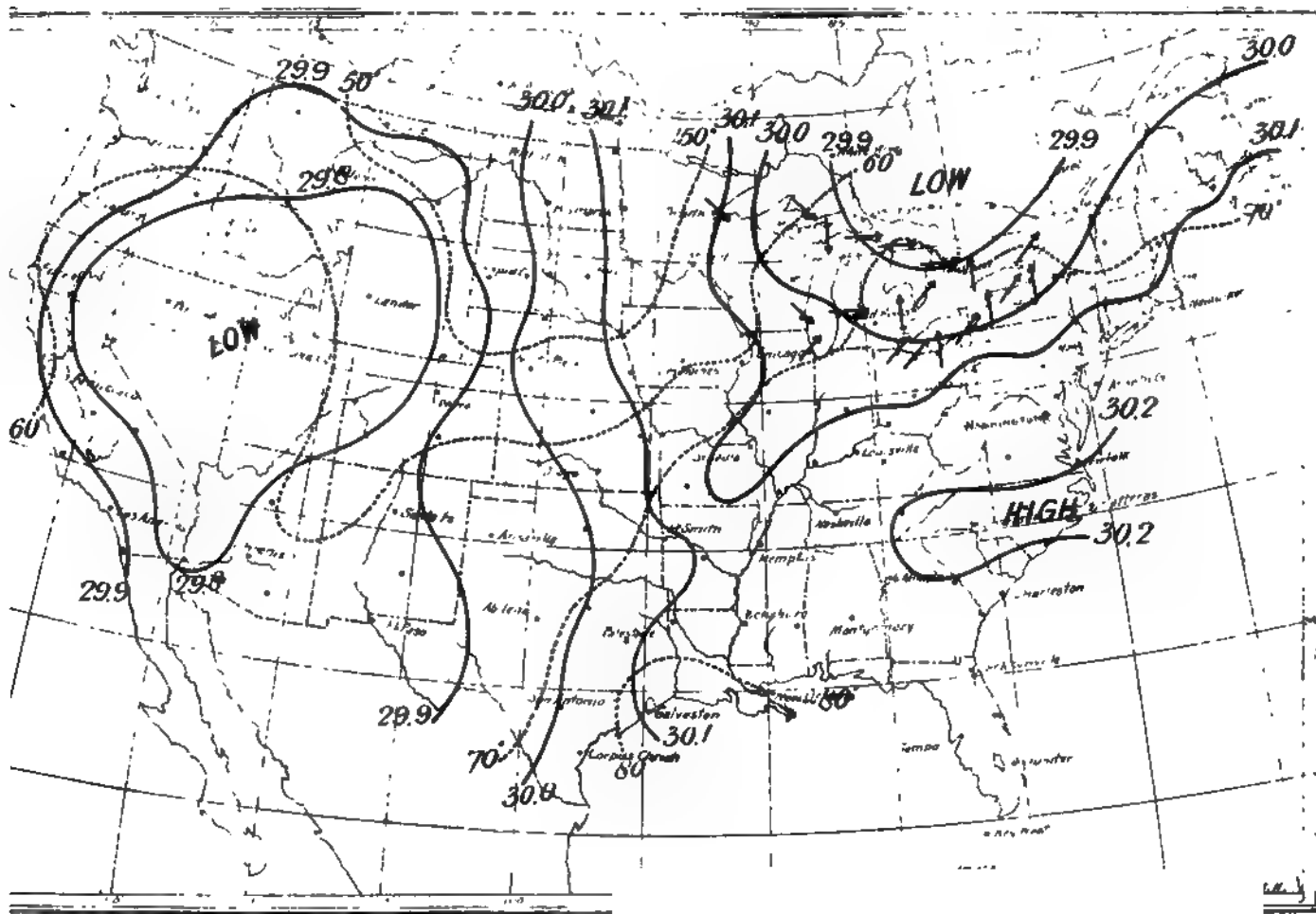
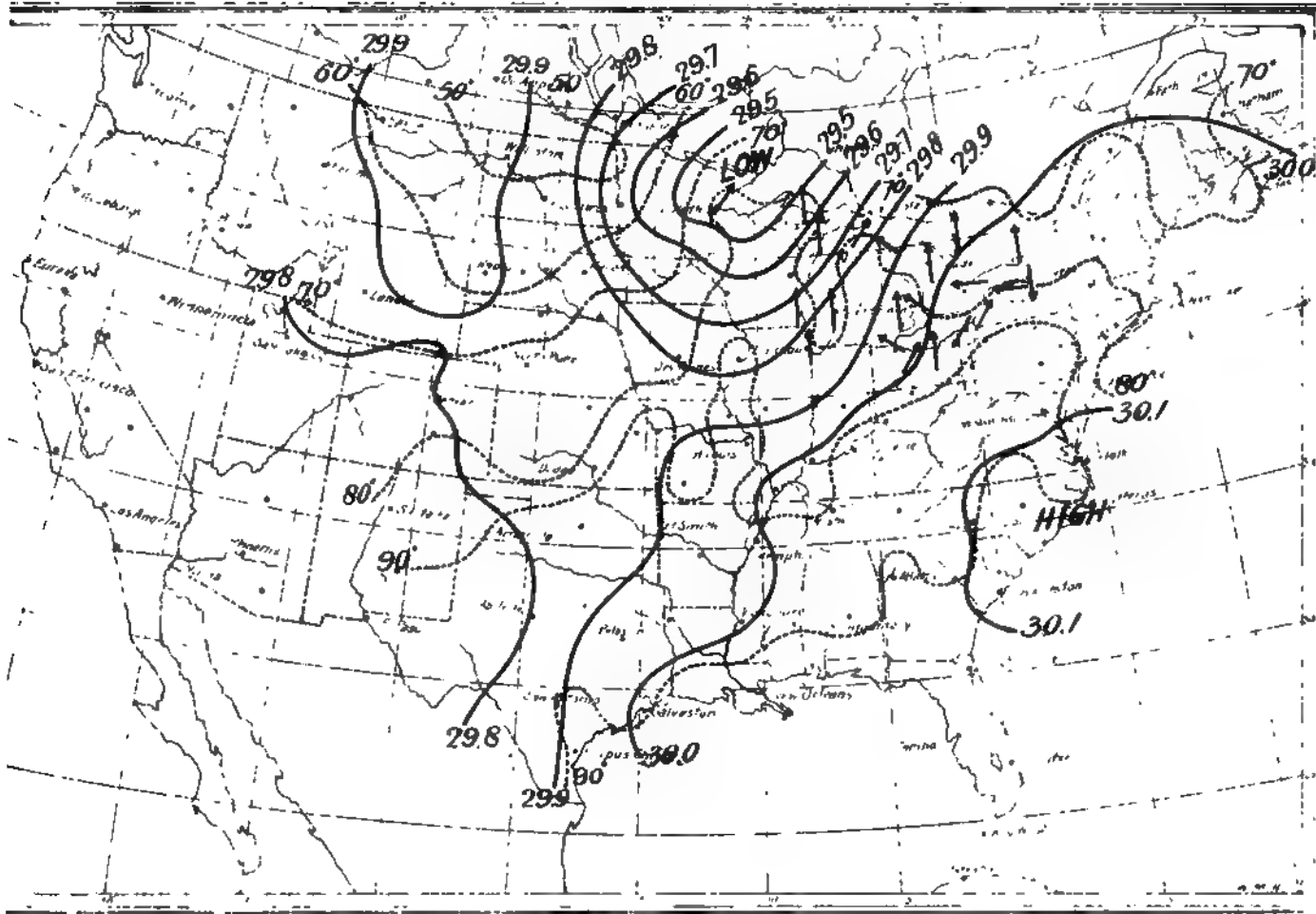


Chart CXXXVII

July 15, 1891—8 p. m.

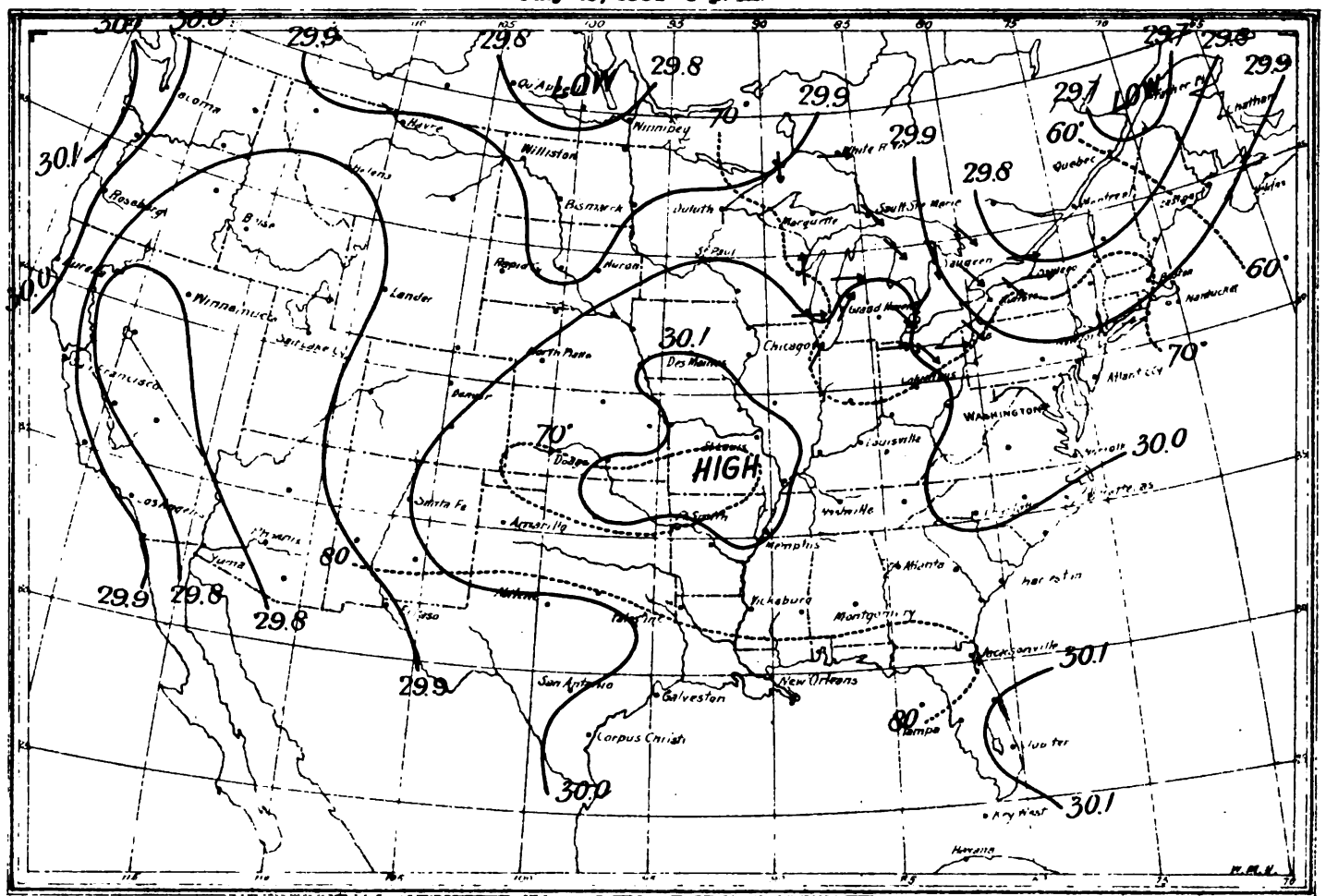
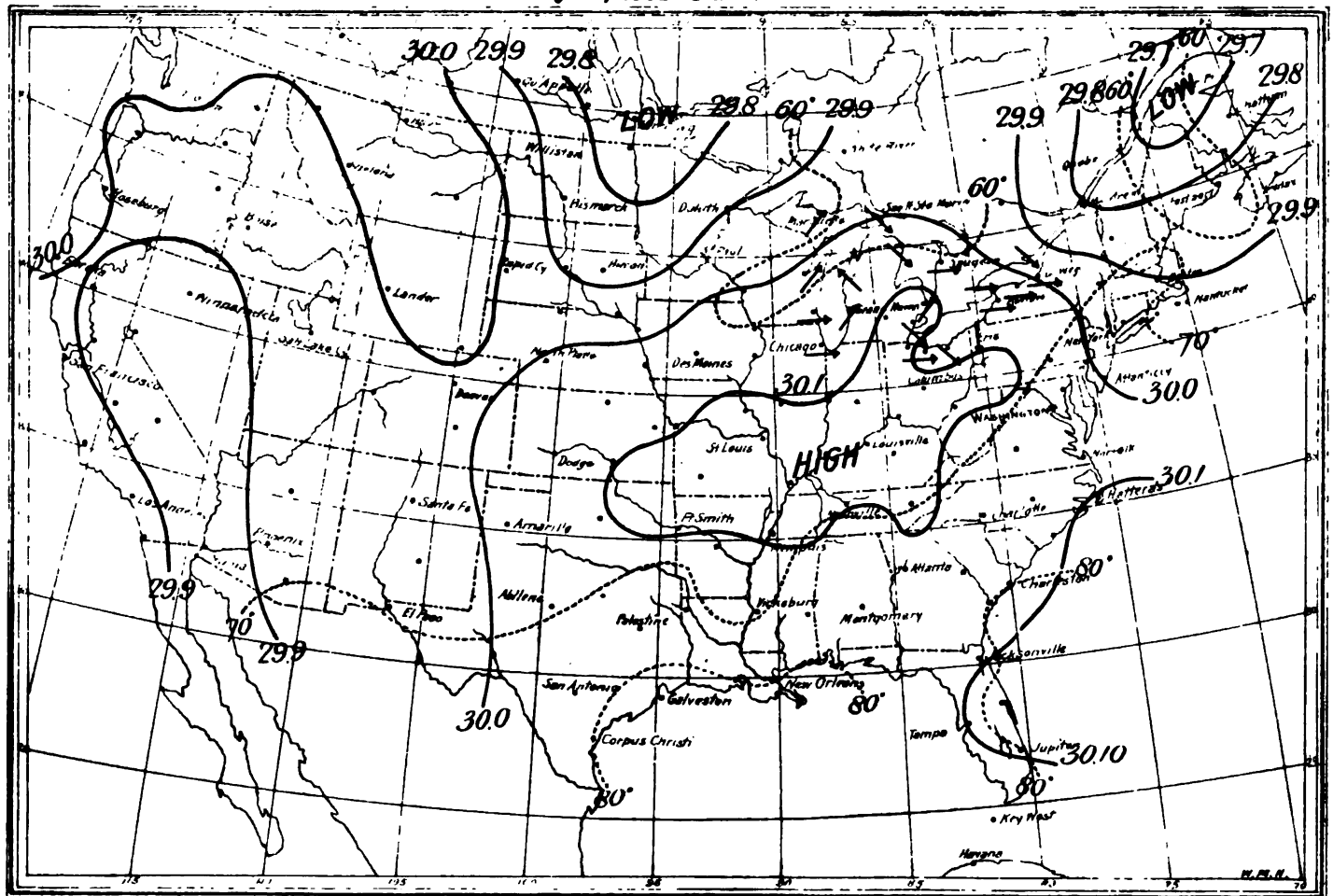
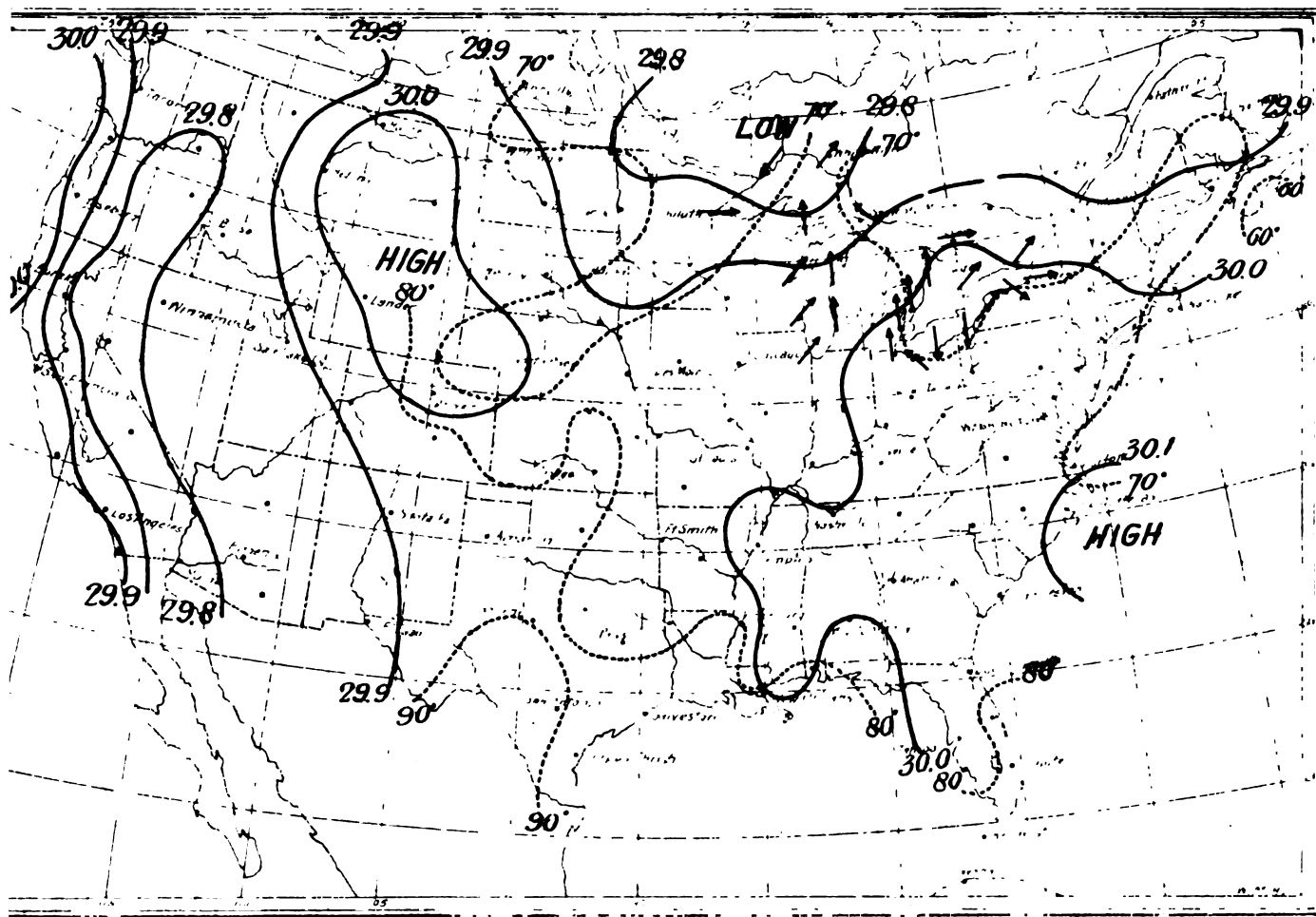


Chart CXXXVIII

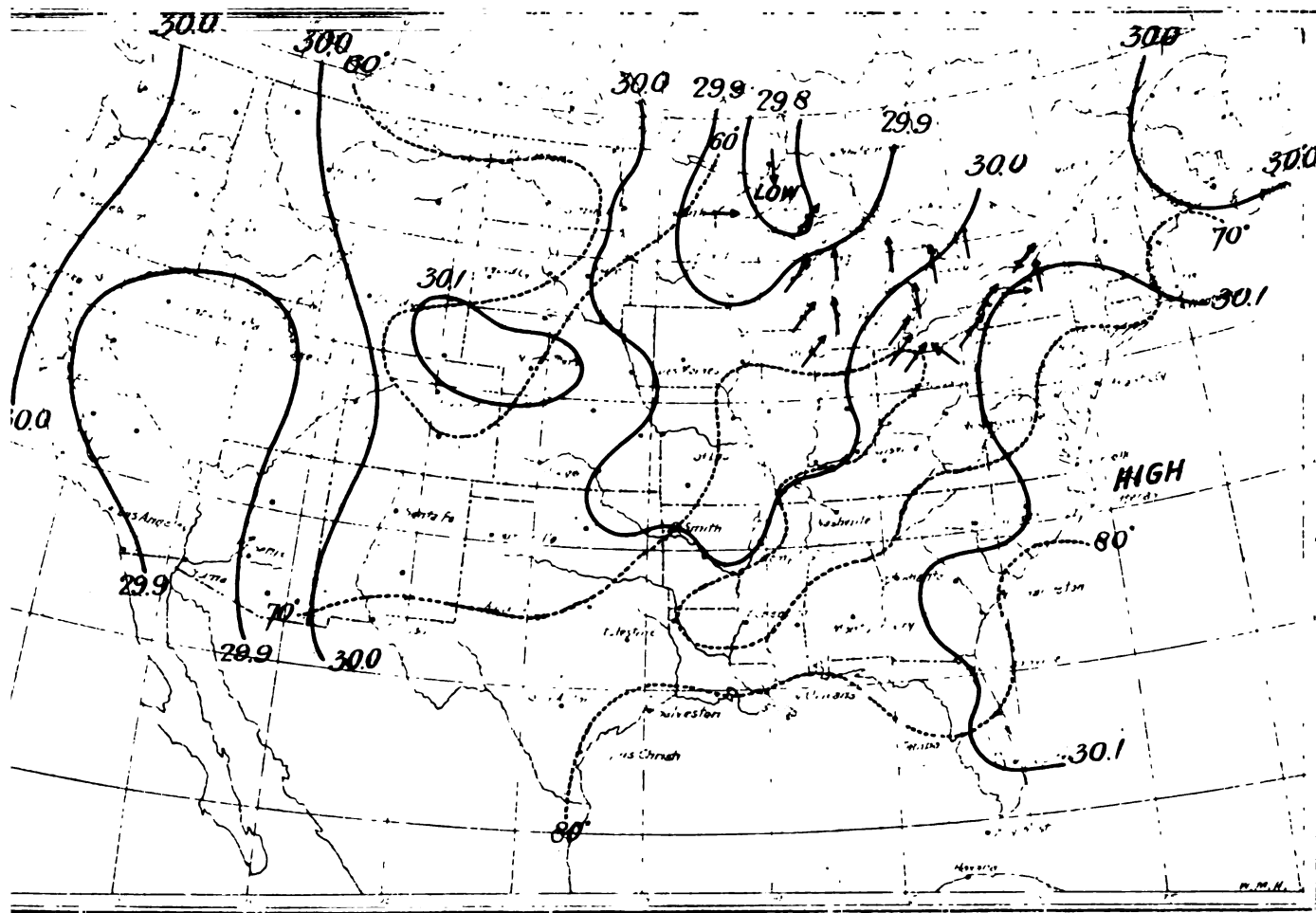
July 16, 1891—8 a. m.

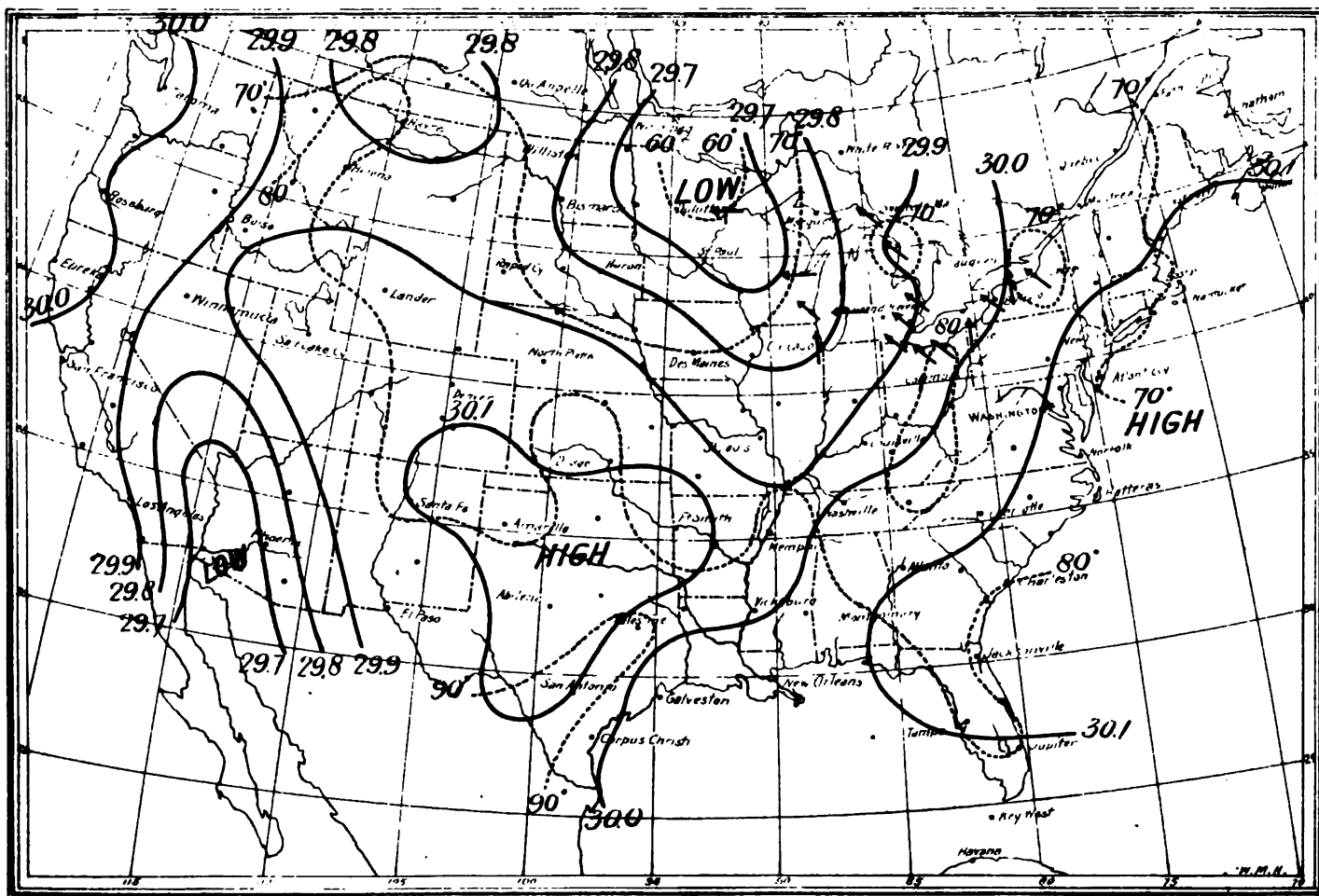
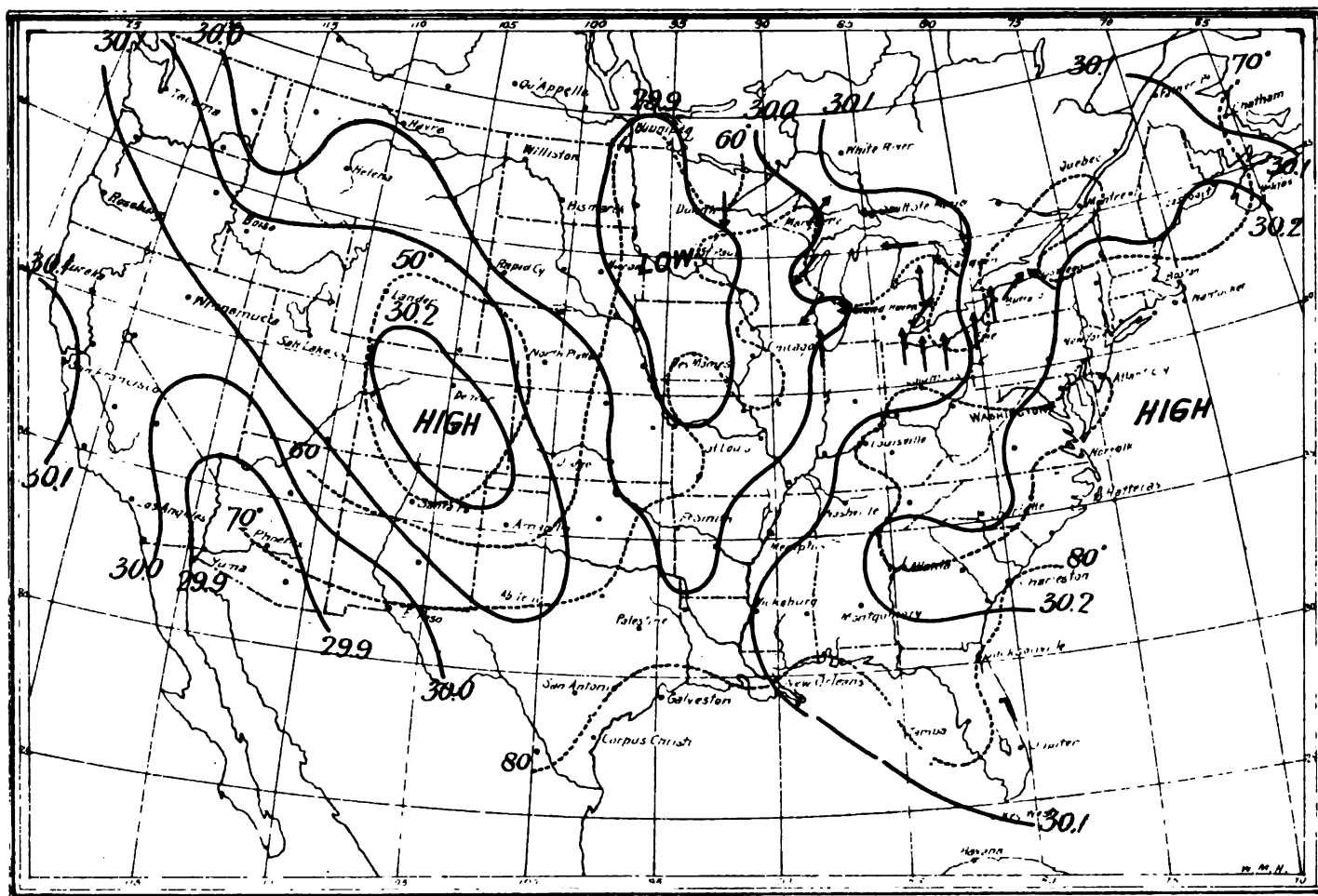


July 16, 1891—8 p. m.

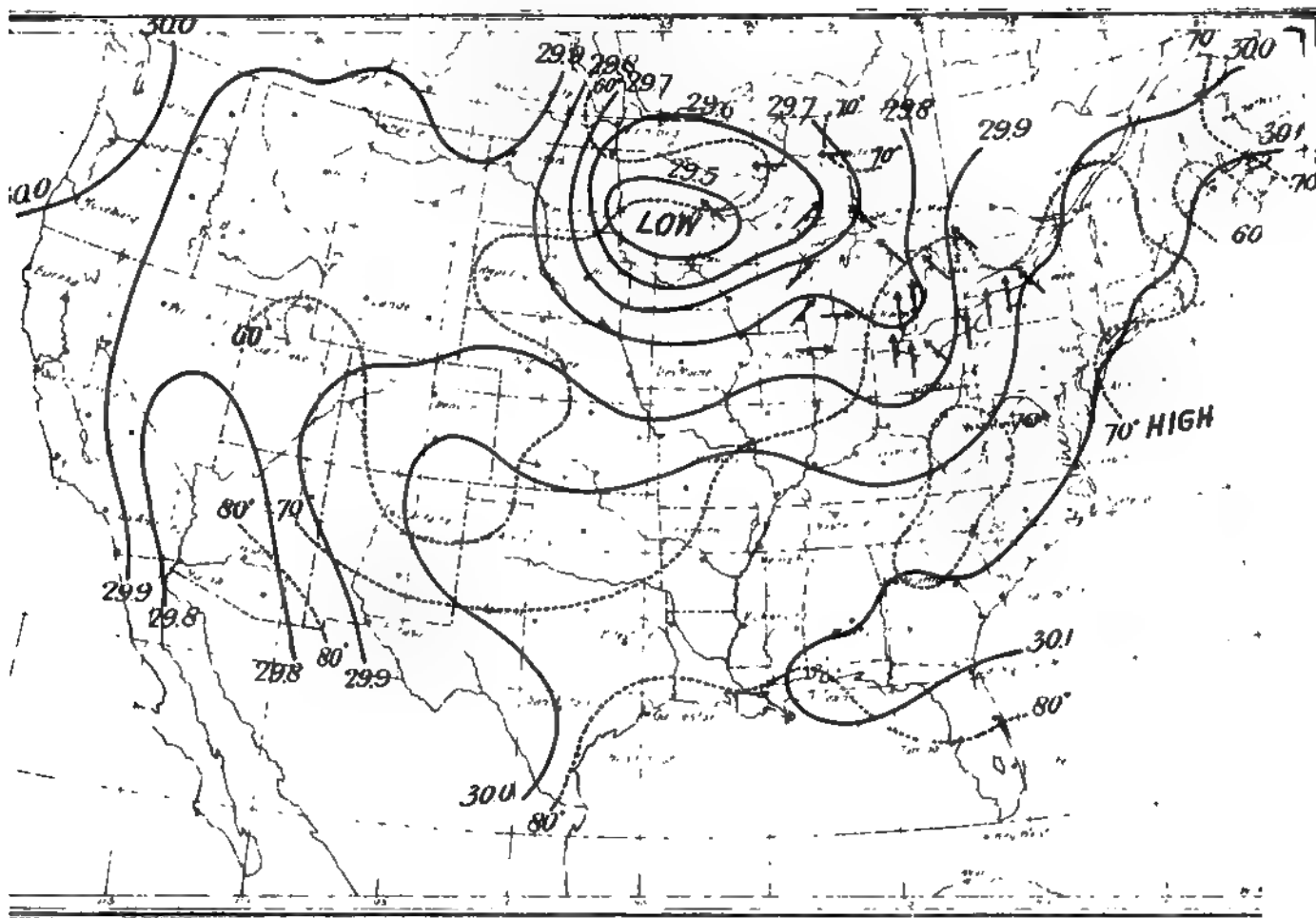


July 17, 1891—8 a. m.





July 21, 1897—8 a. m.



July 21, 1897—8 p. m.

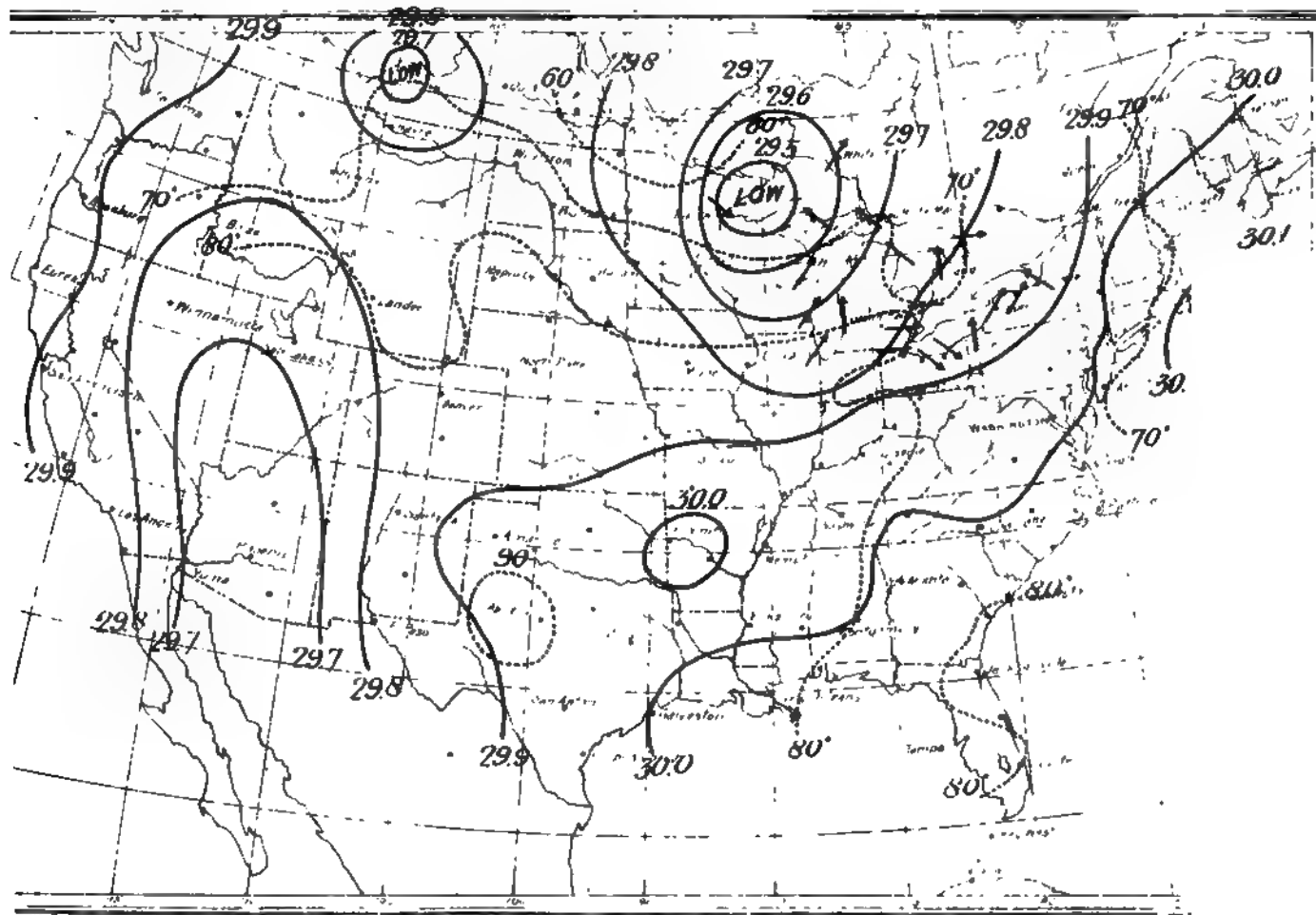


Chart 0000V.

July 18, 1898—8 a. m.

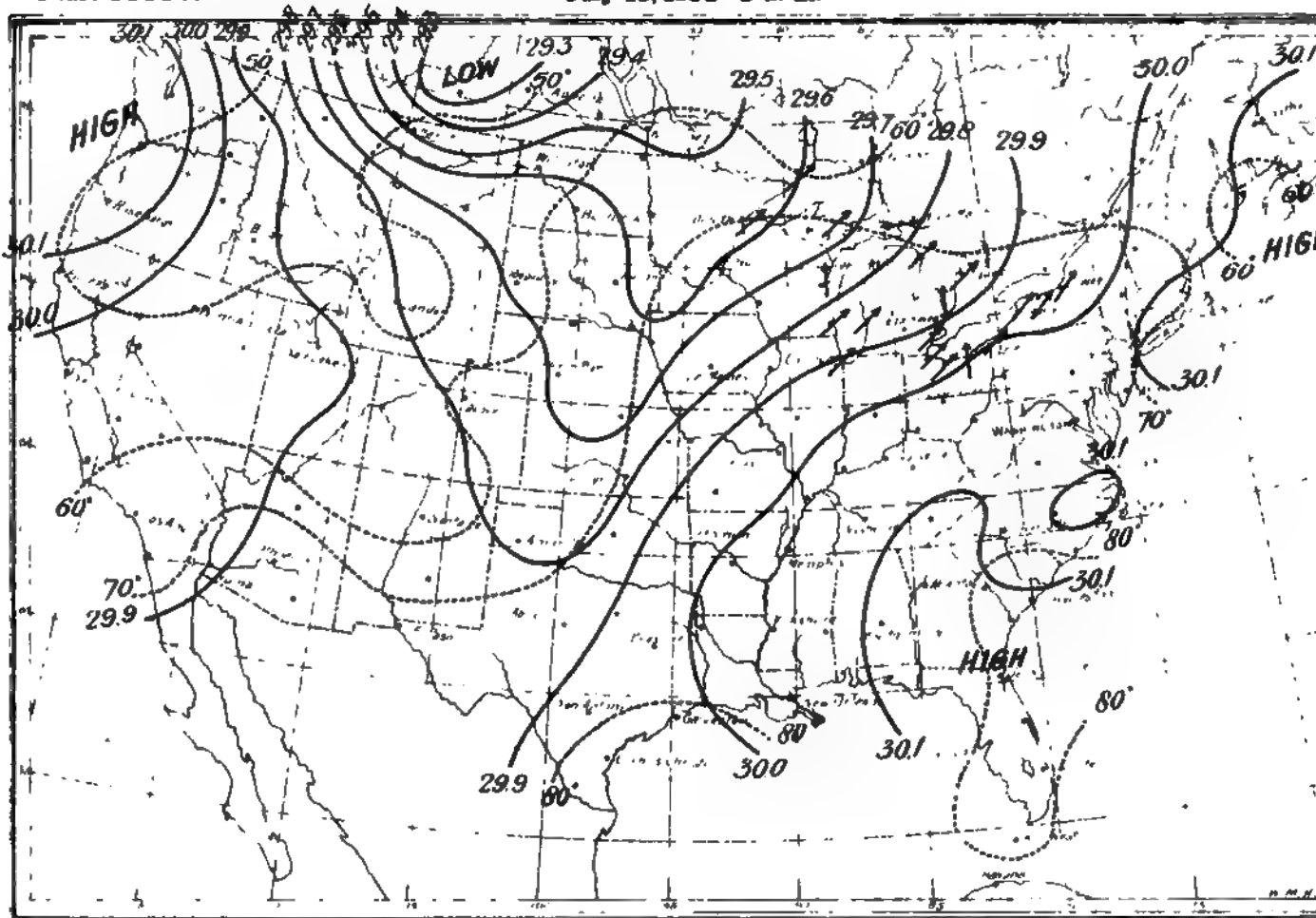
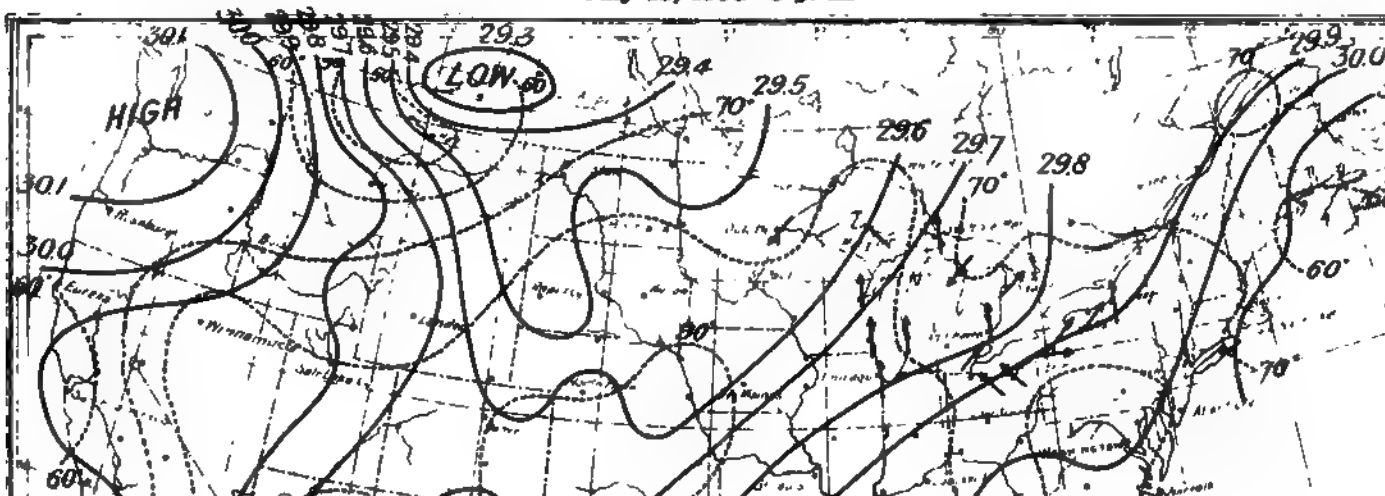


Chart 0000V1.

July 18, 1898—8 p. m.



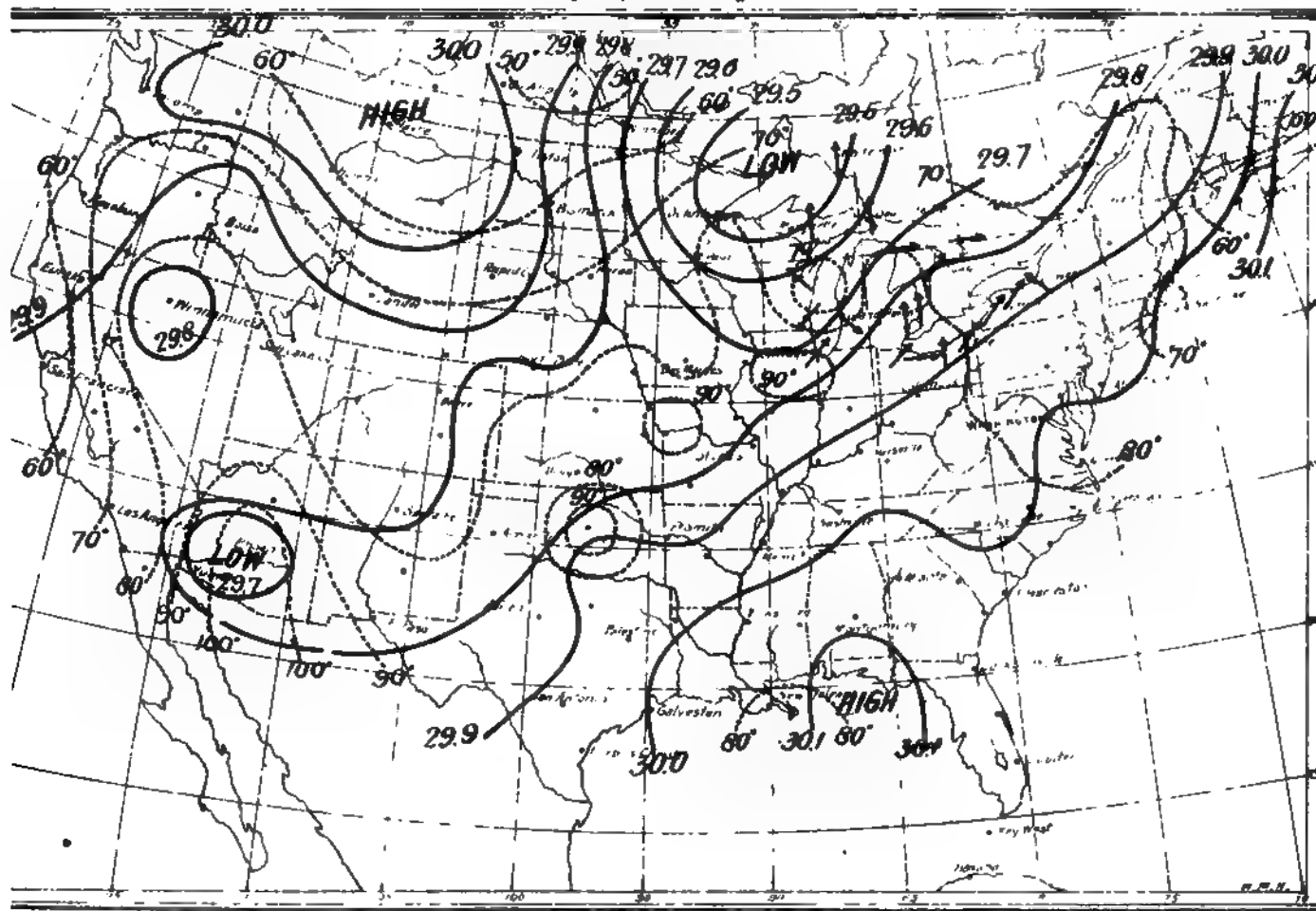
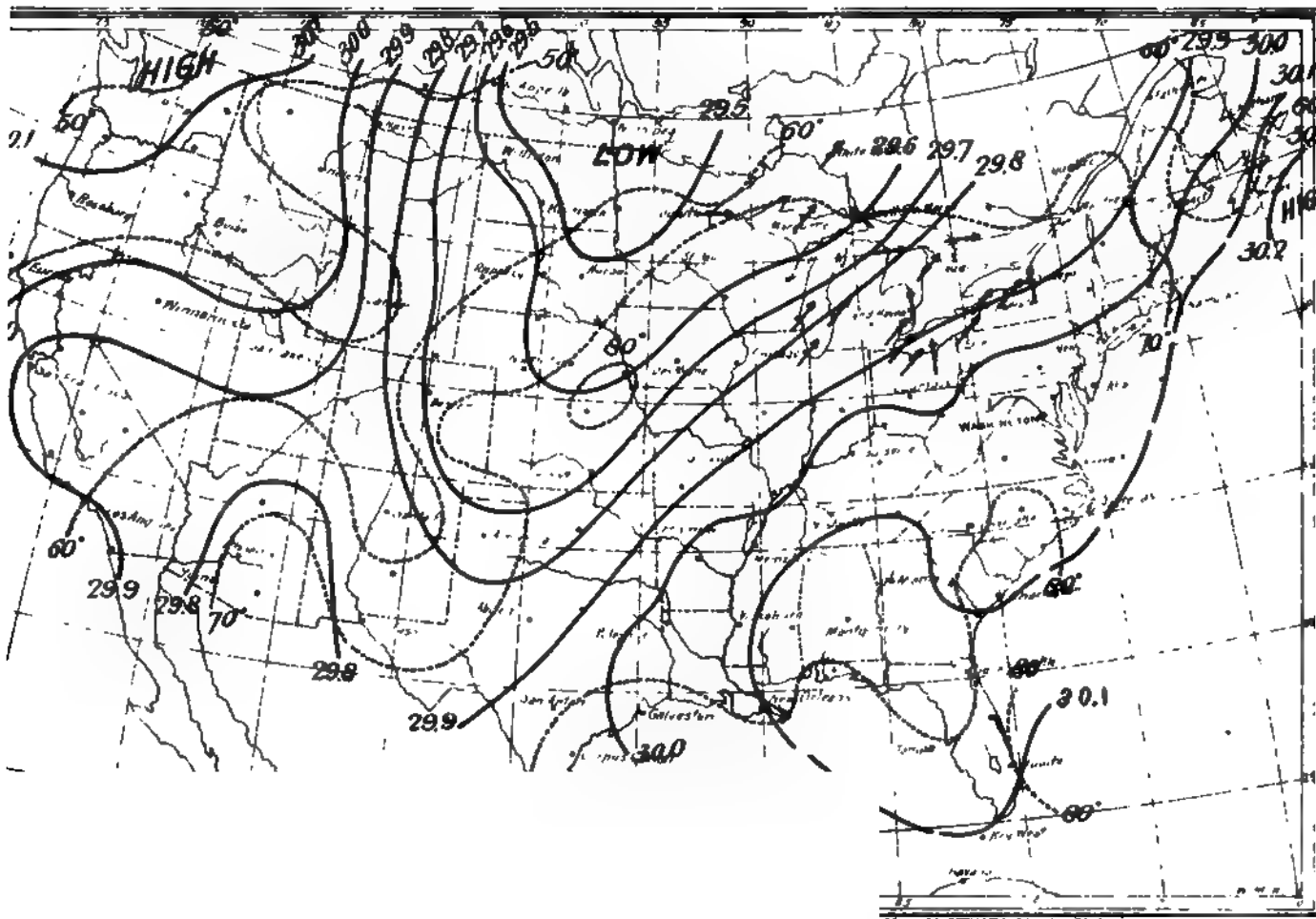


Chart 0000IX.

August 12, 1878—4:35 p. m.

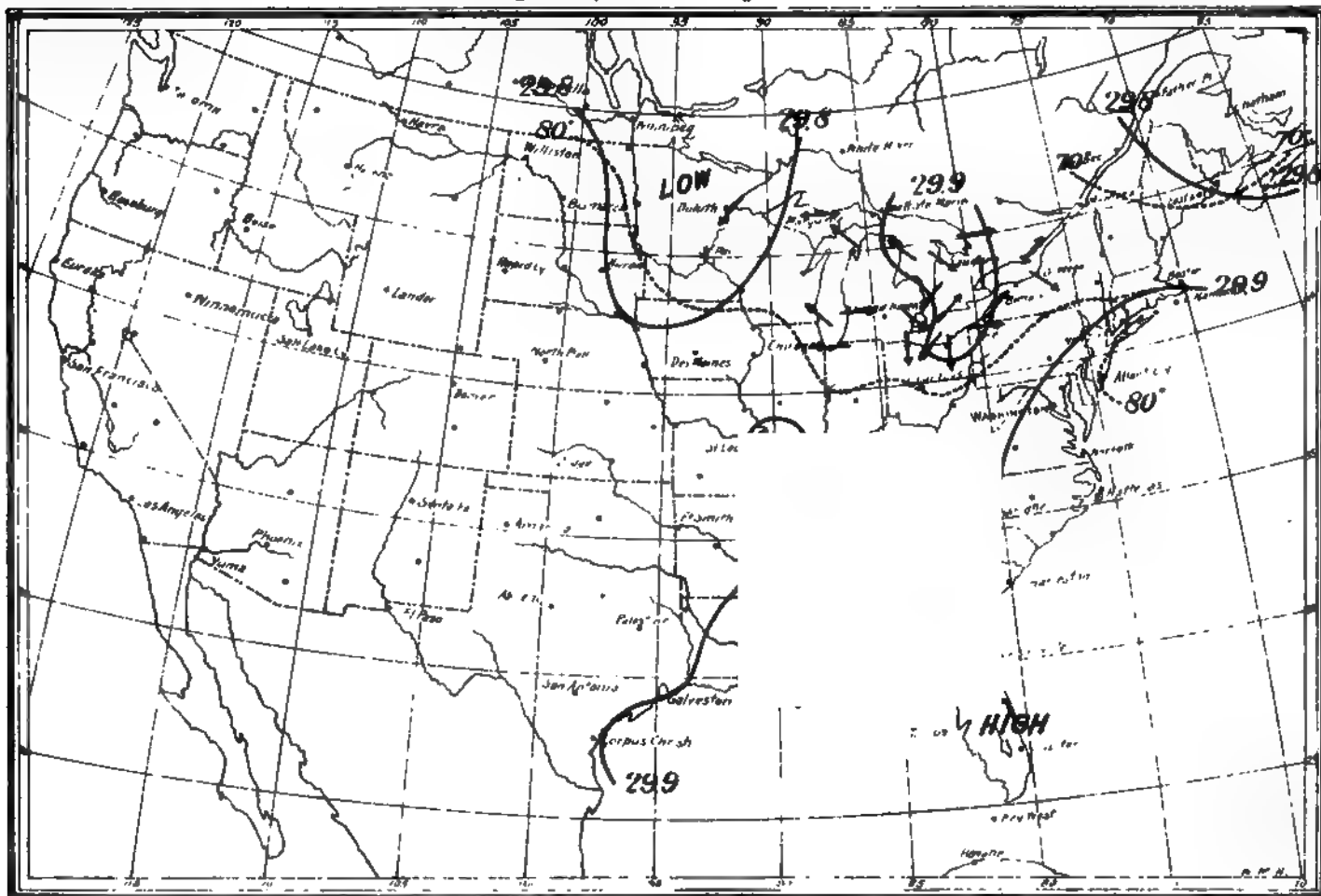
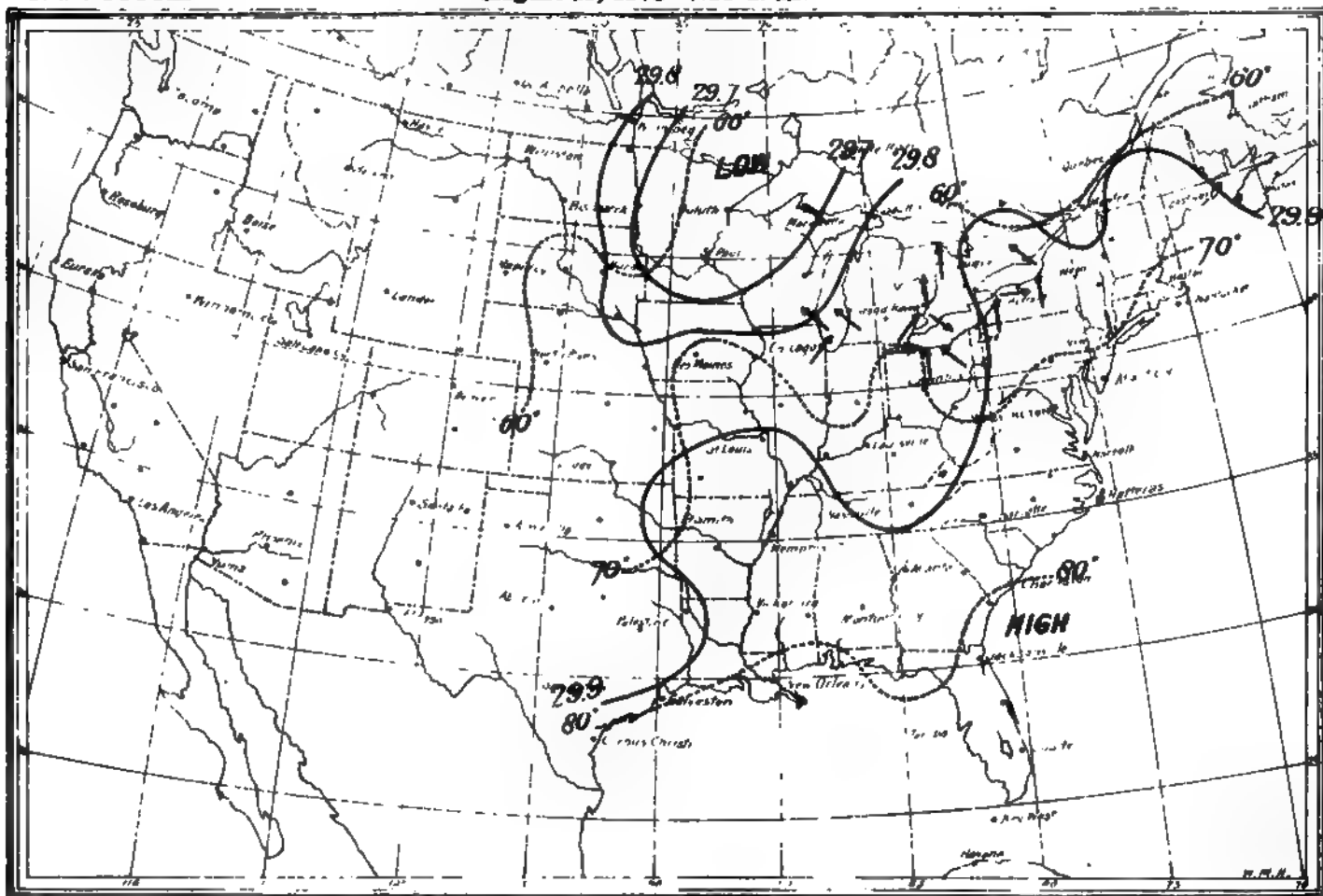
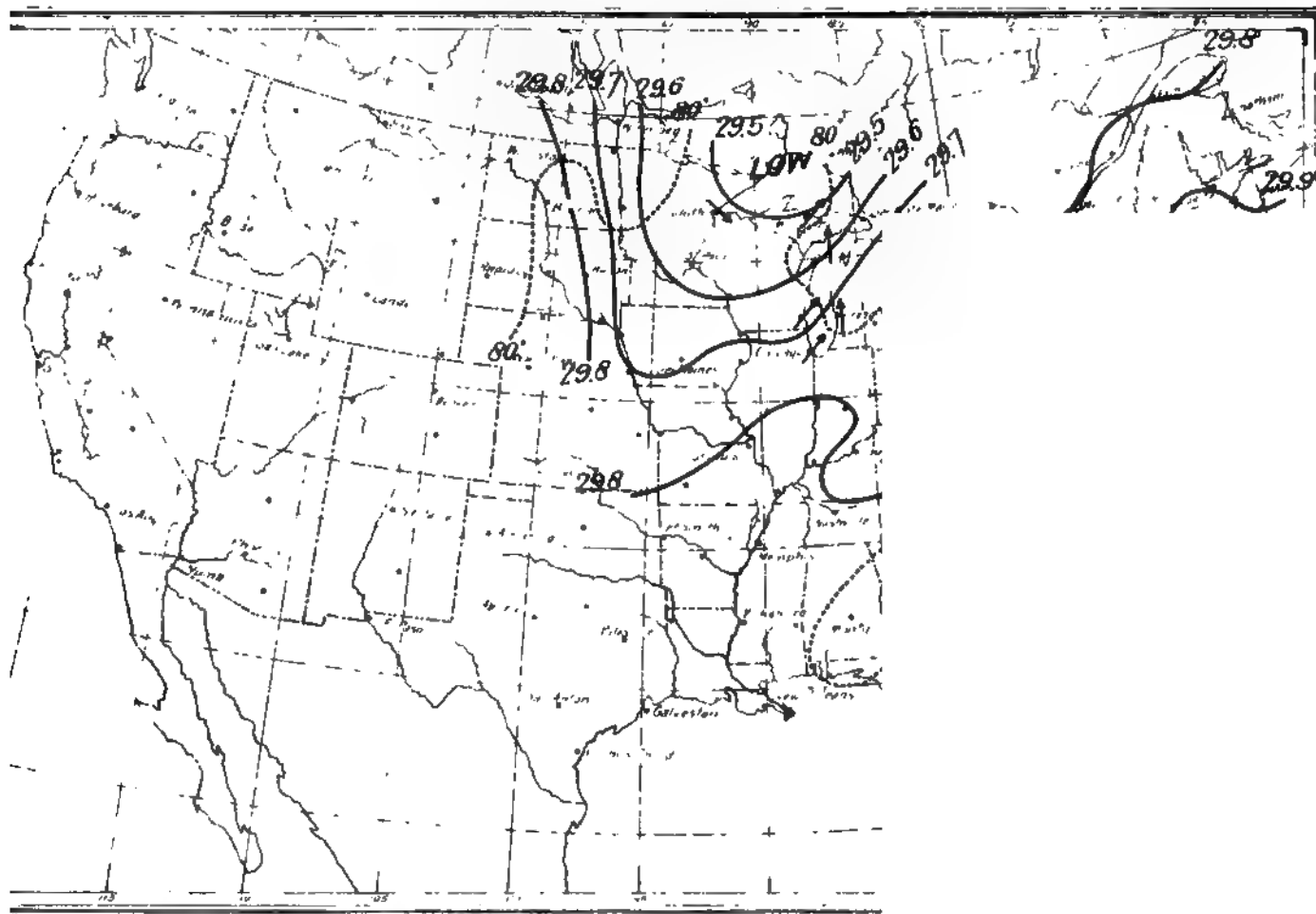


Chart 0000IX.

August 18, 1878—7:35 a. m.



August 13, 1878—4:35 p. m.



August 14, 1878—7:35 a. m.

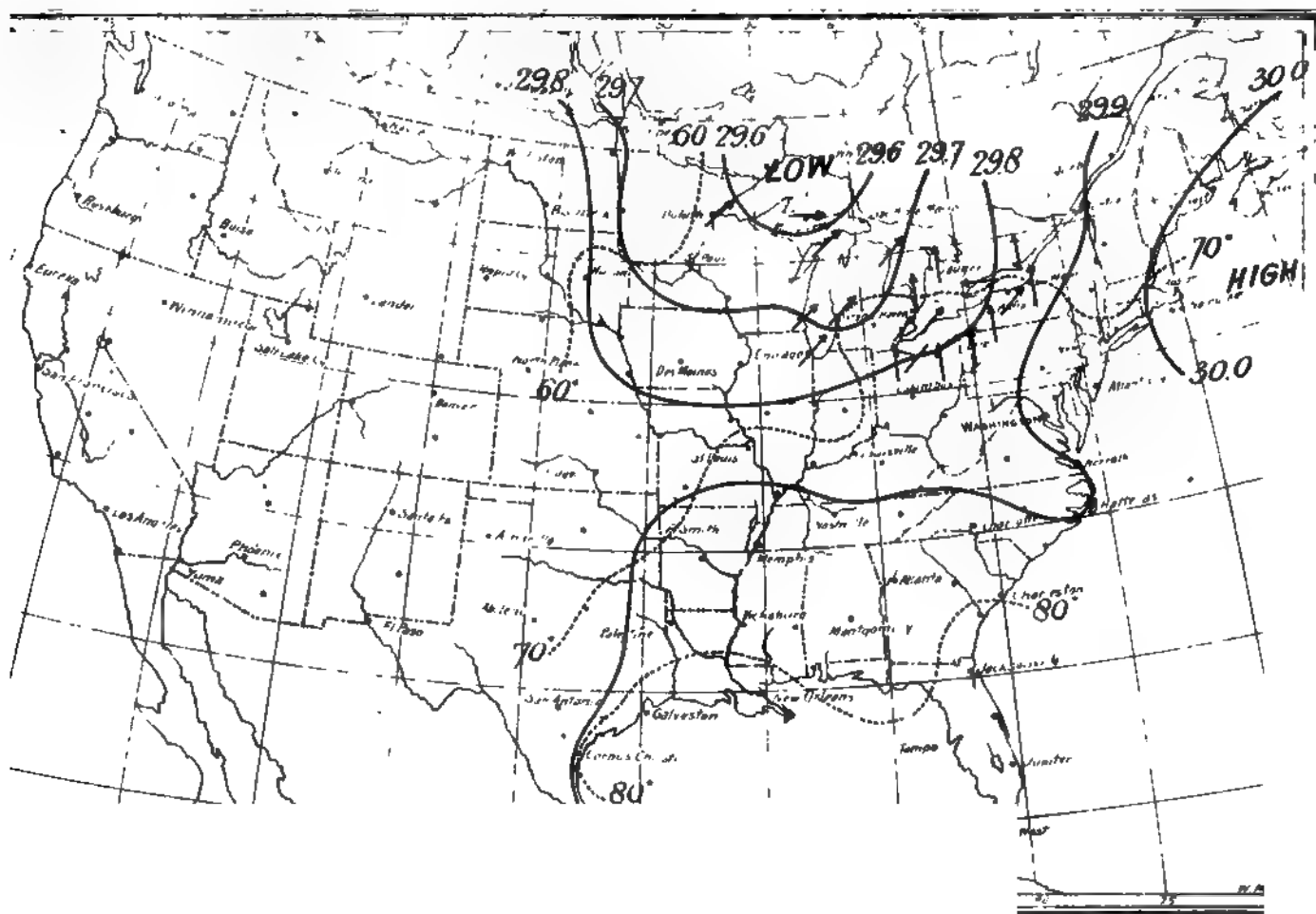


Chart CCCCXIII.

August 21, 1888—7 a. m.

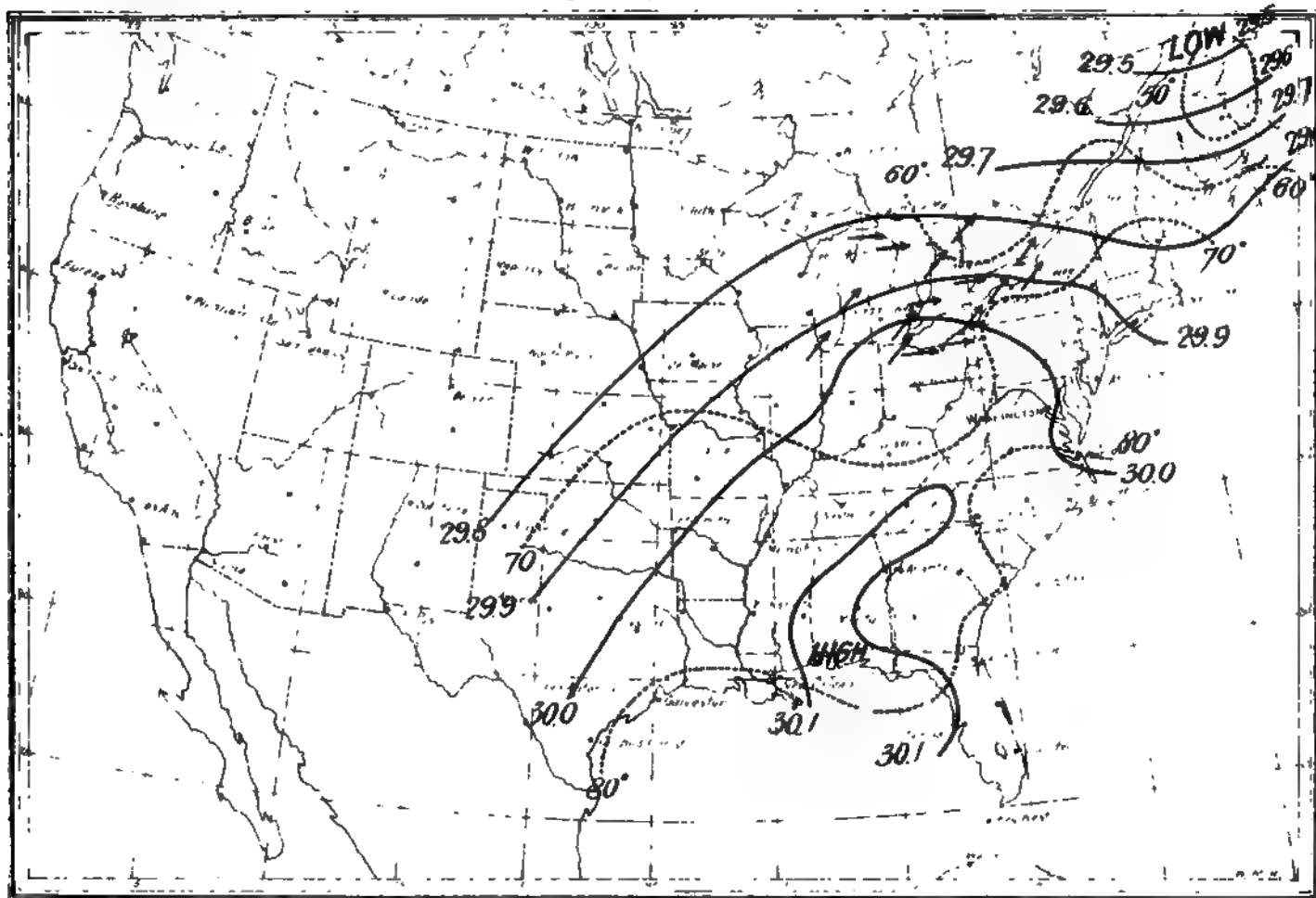


Chart CCCCXIV.

August 21, 1888—3 p. m.

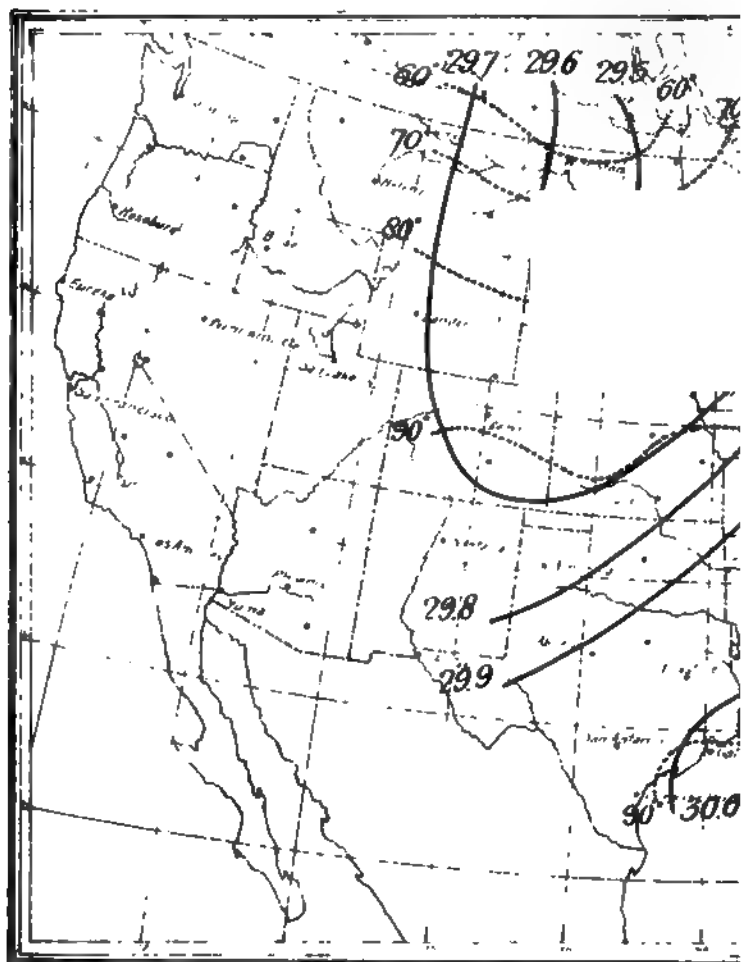


Chart 0000XV.

August 22, 1888—7 a. m.

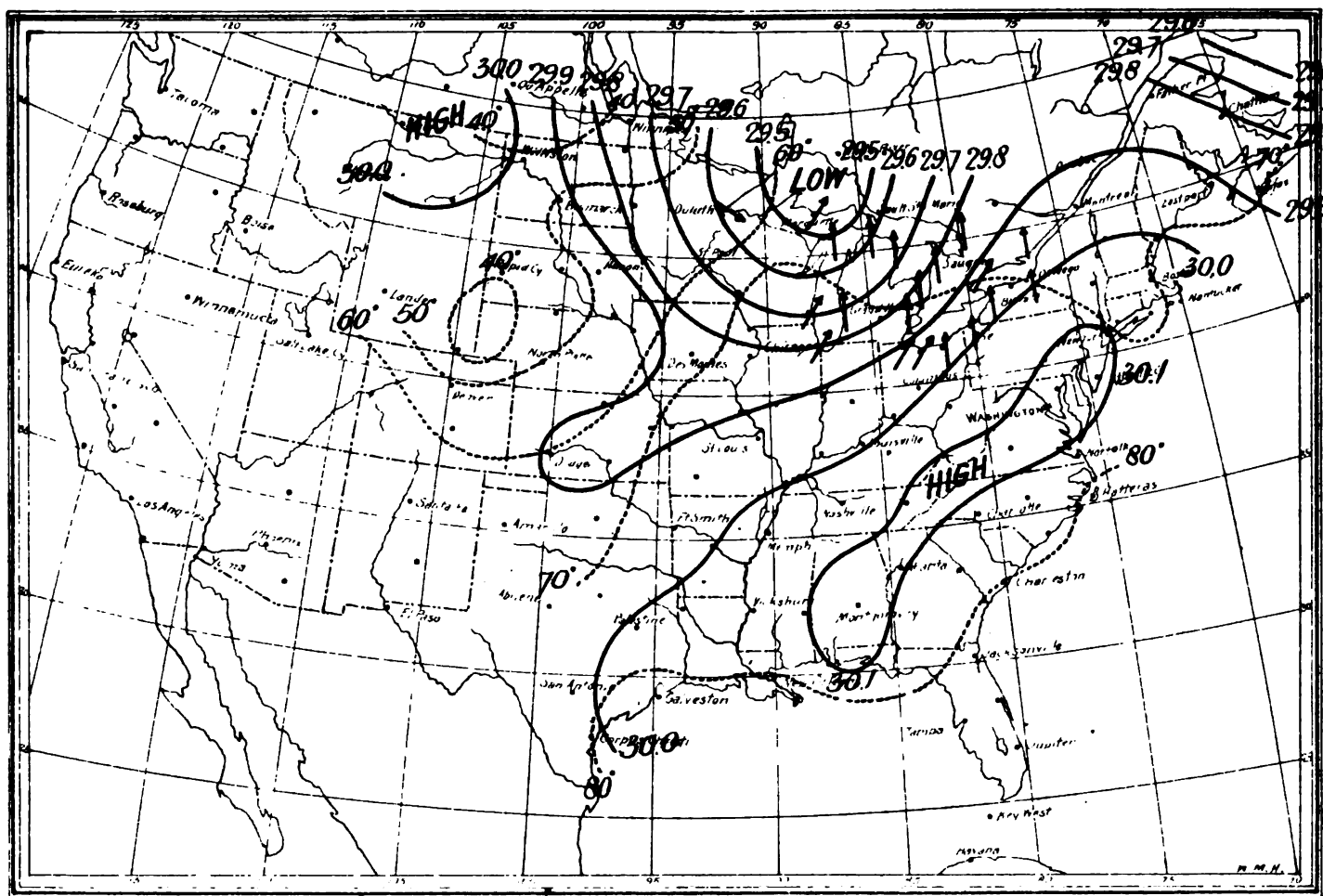


Chart 0000XVI.

August 22, 1888—3 p. m.

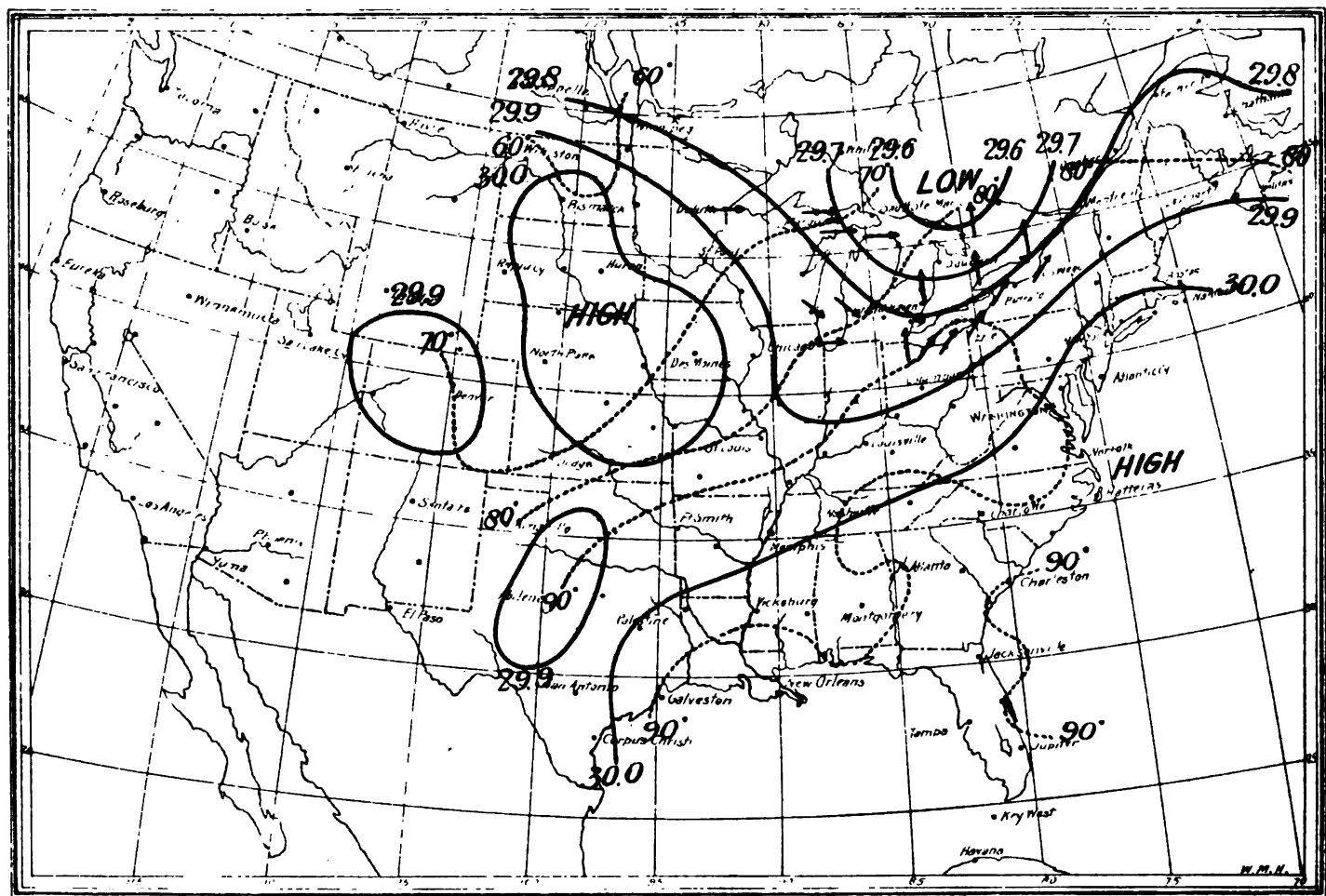


Chart CCCCXVII.

August 1, 1885—3 p. m.

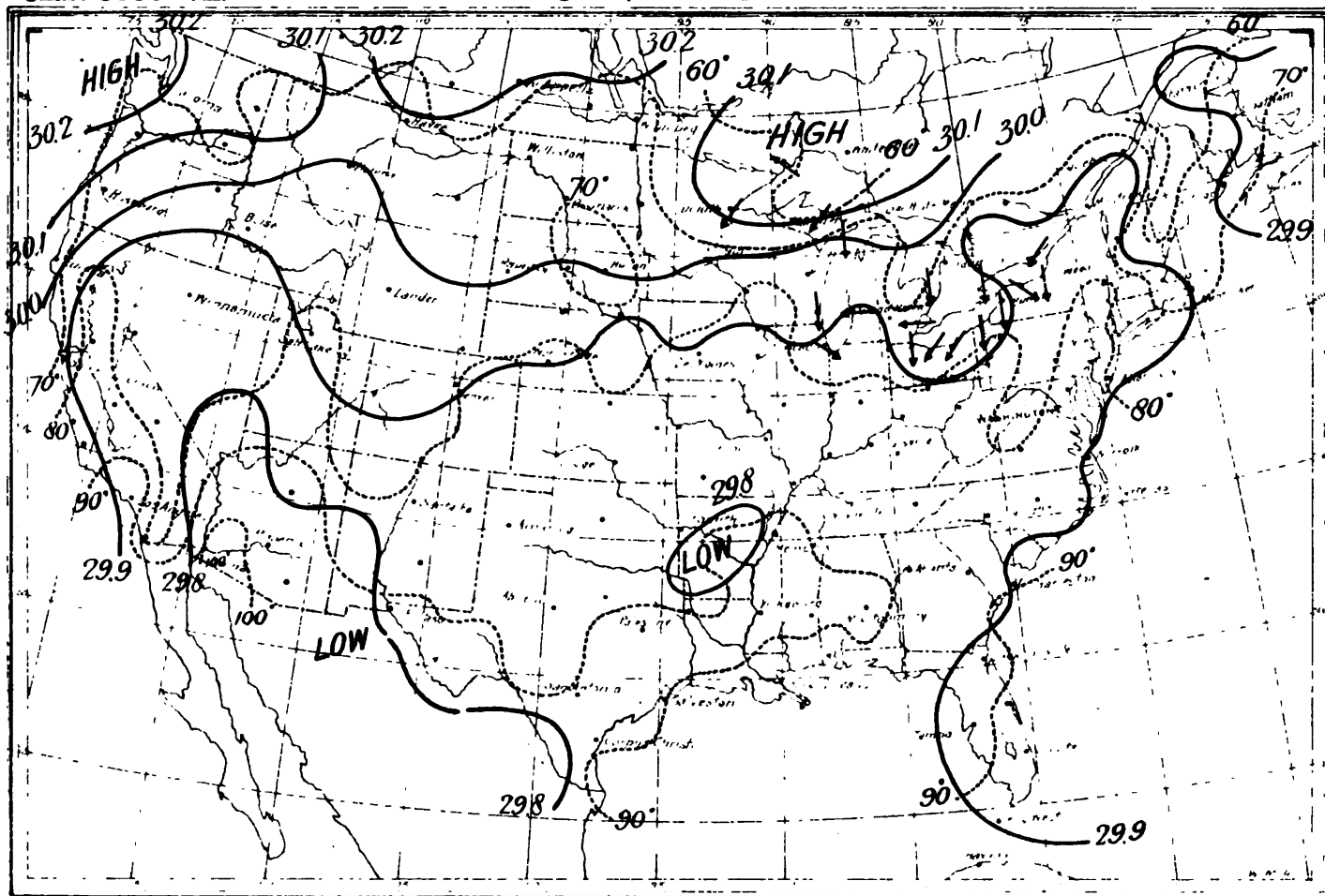


Chart CCCCXVIII.

August 2, 1885—7 a. m.

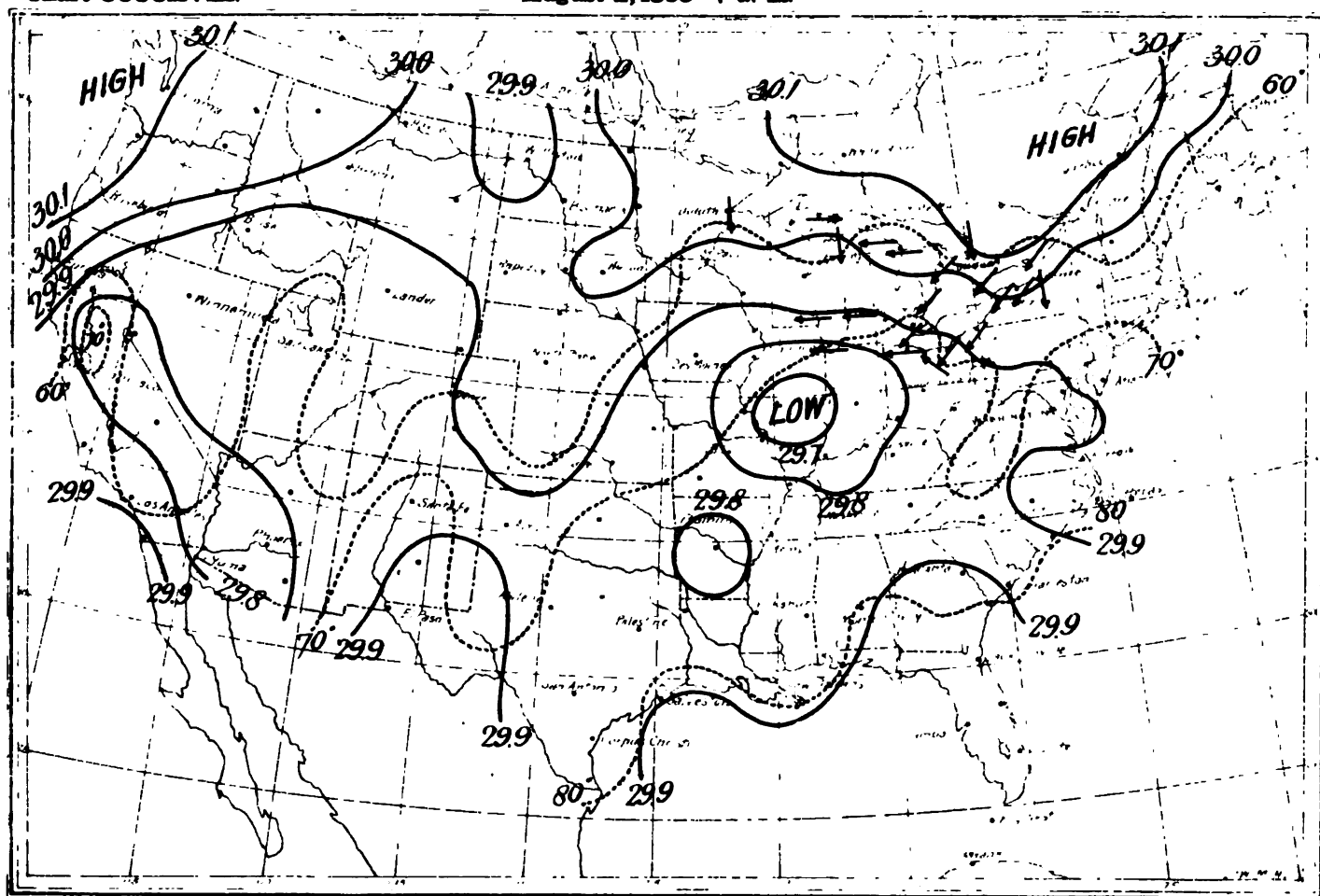


Chart 0000XIX.

August 2, 1885—3 p. m.

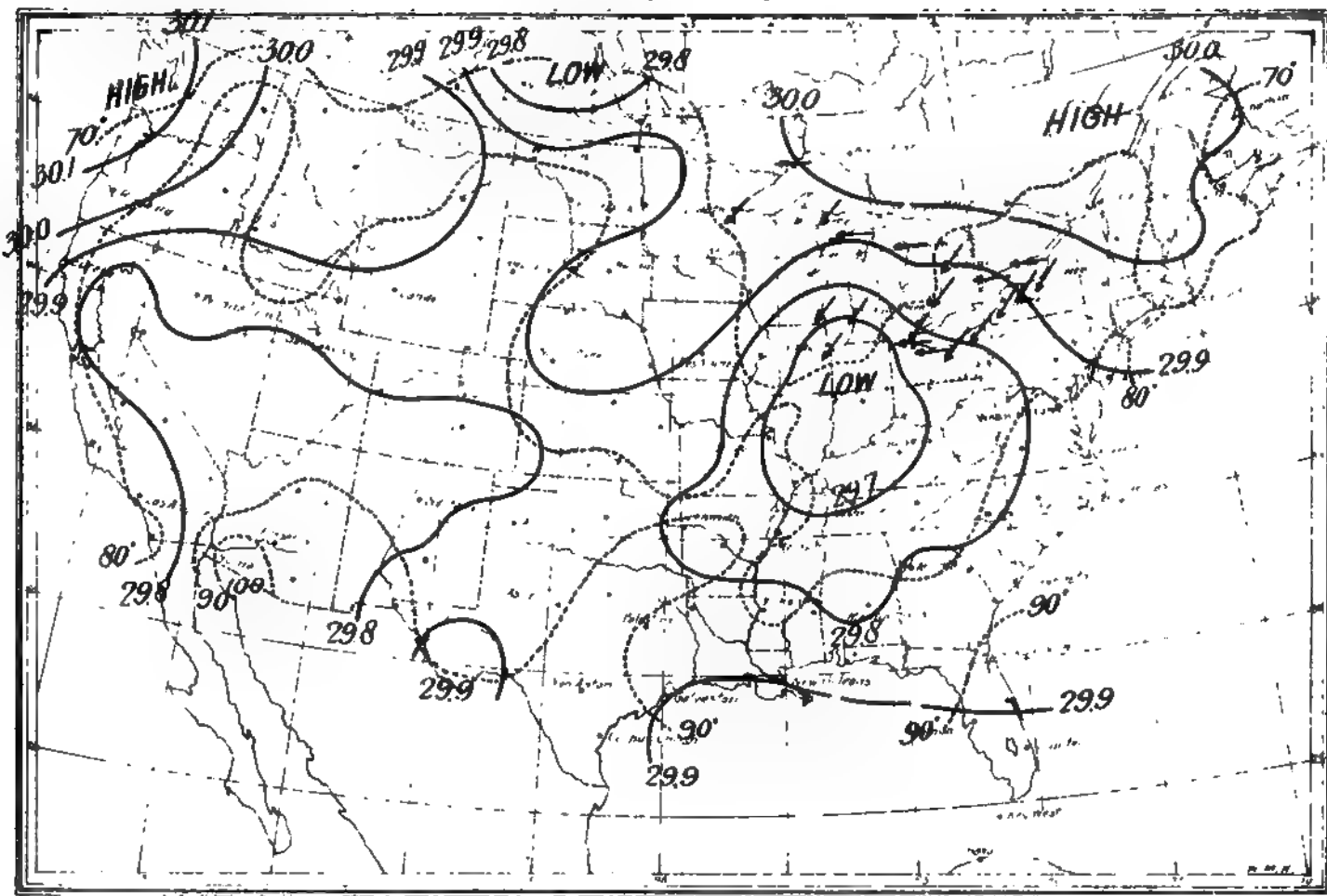


Chart 0000XX.

August 3, 1885—7 a. m.

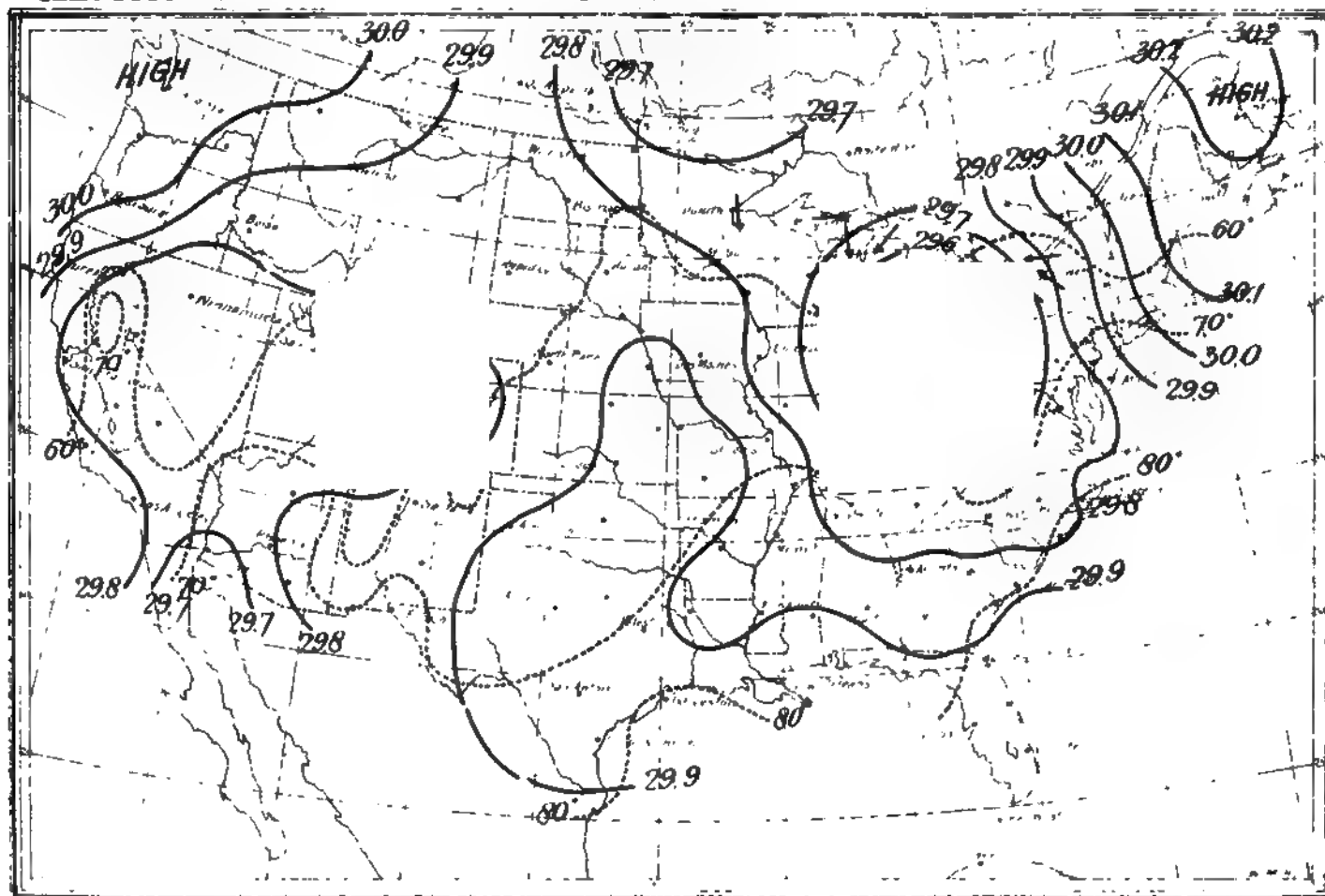


Chart OOOOXXI.

August 20, 1885—7 a. m.

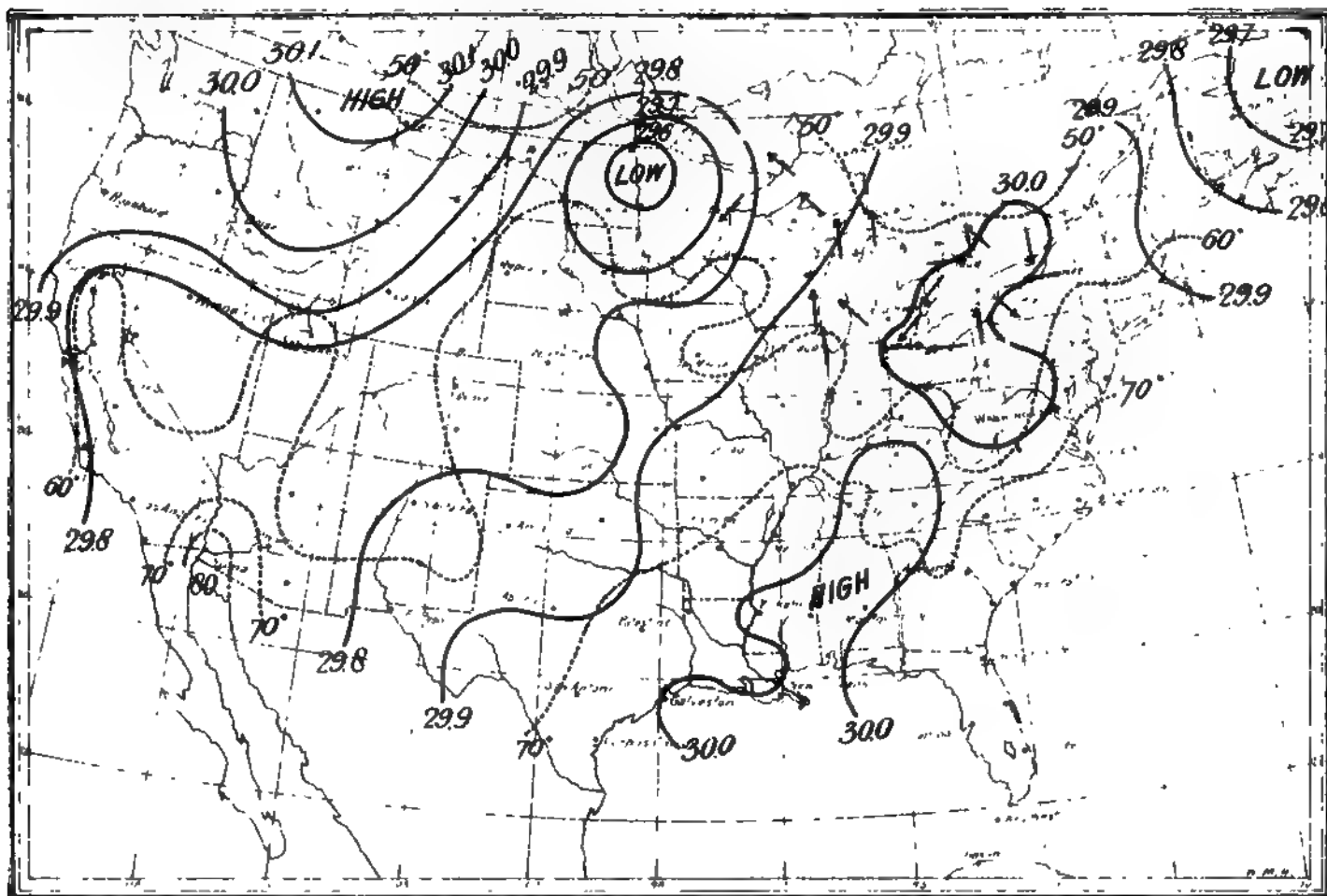


Chart OOOOXXII.

August 20, 1885—3 p. m.

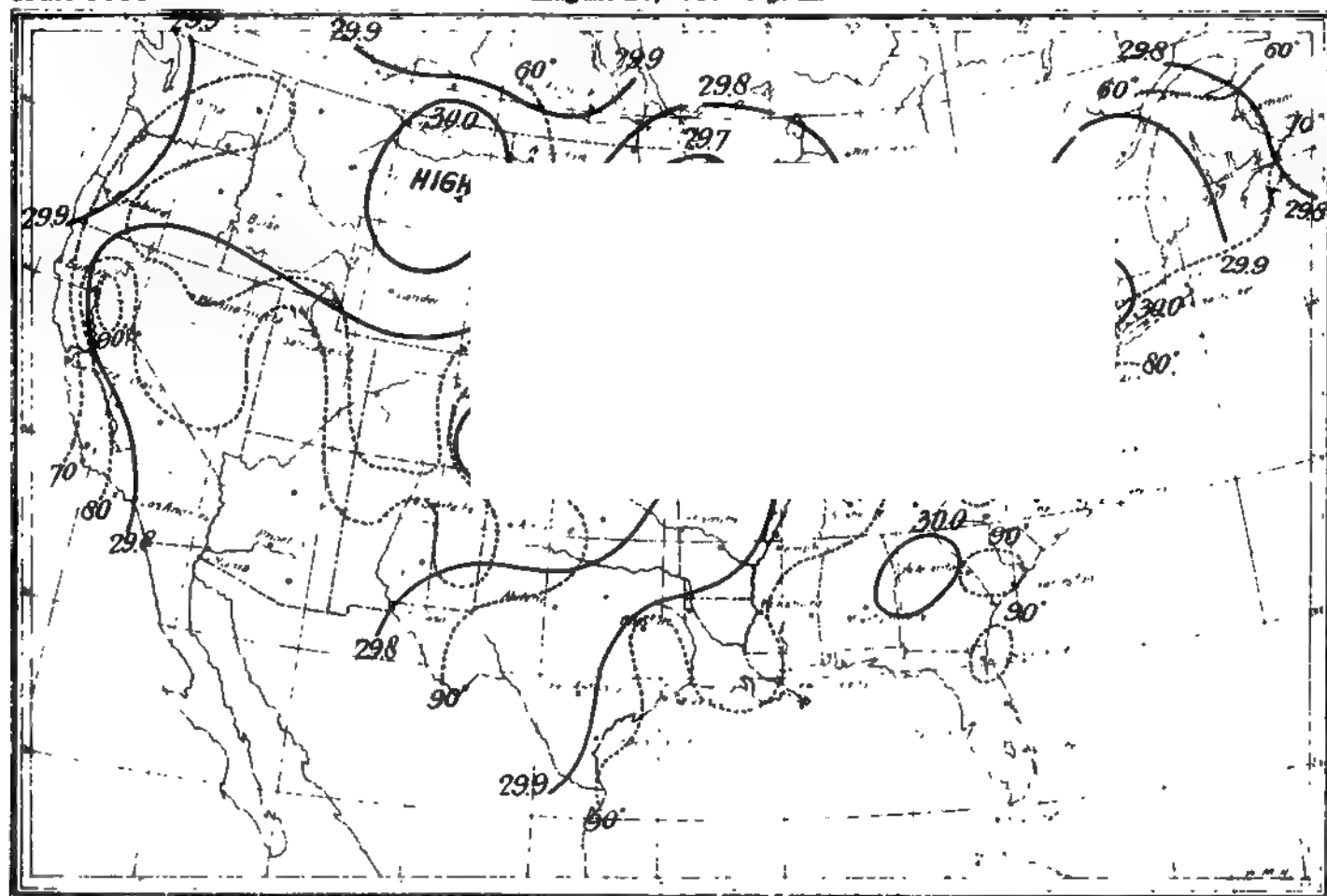


Chart OOOOXXIII.

August 21, 1885—7 a. m.

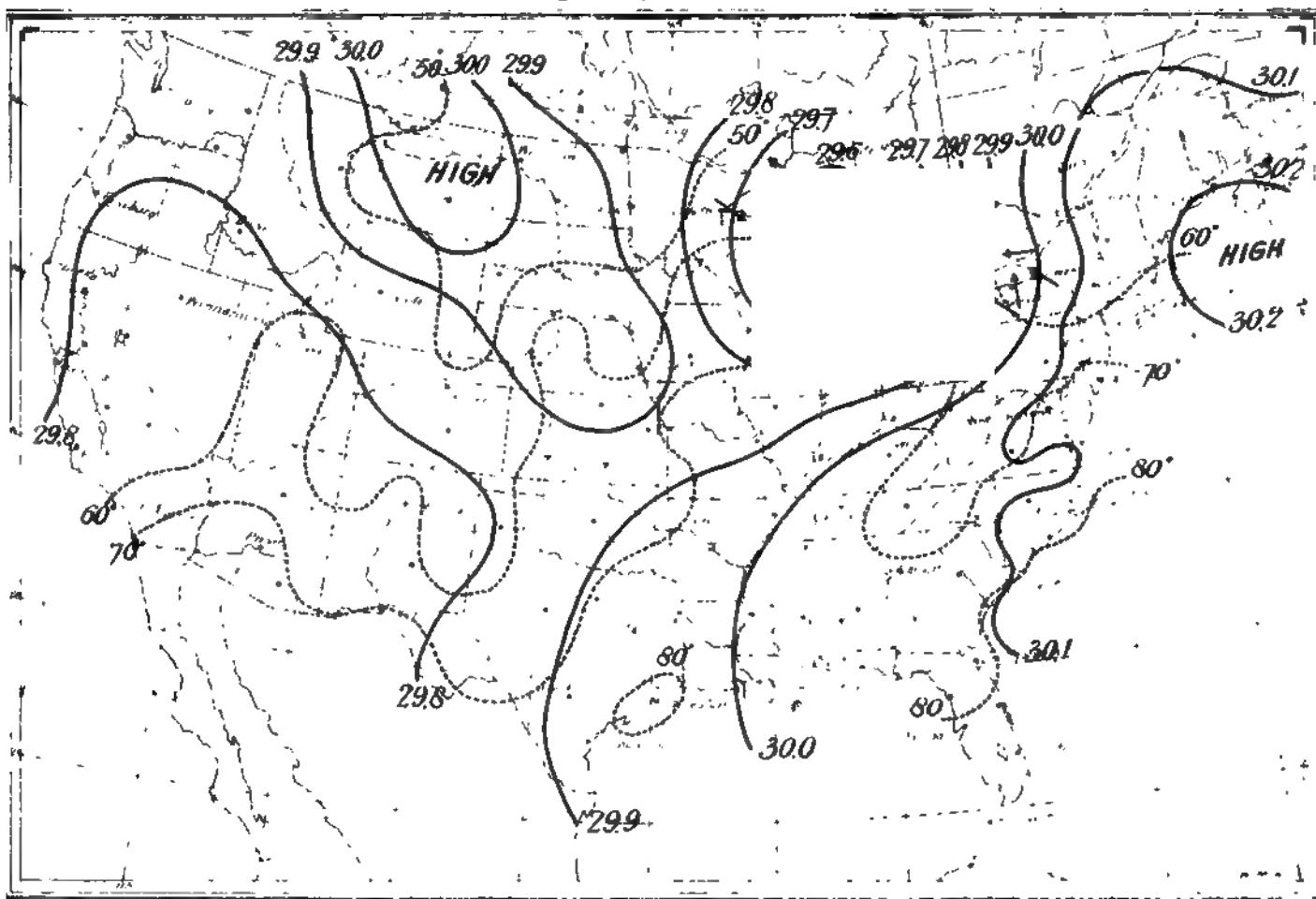


Chart OOOOXXIV.

August 21, 1885—3 p. m.

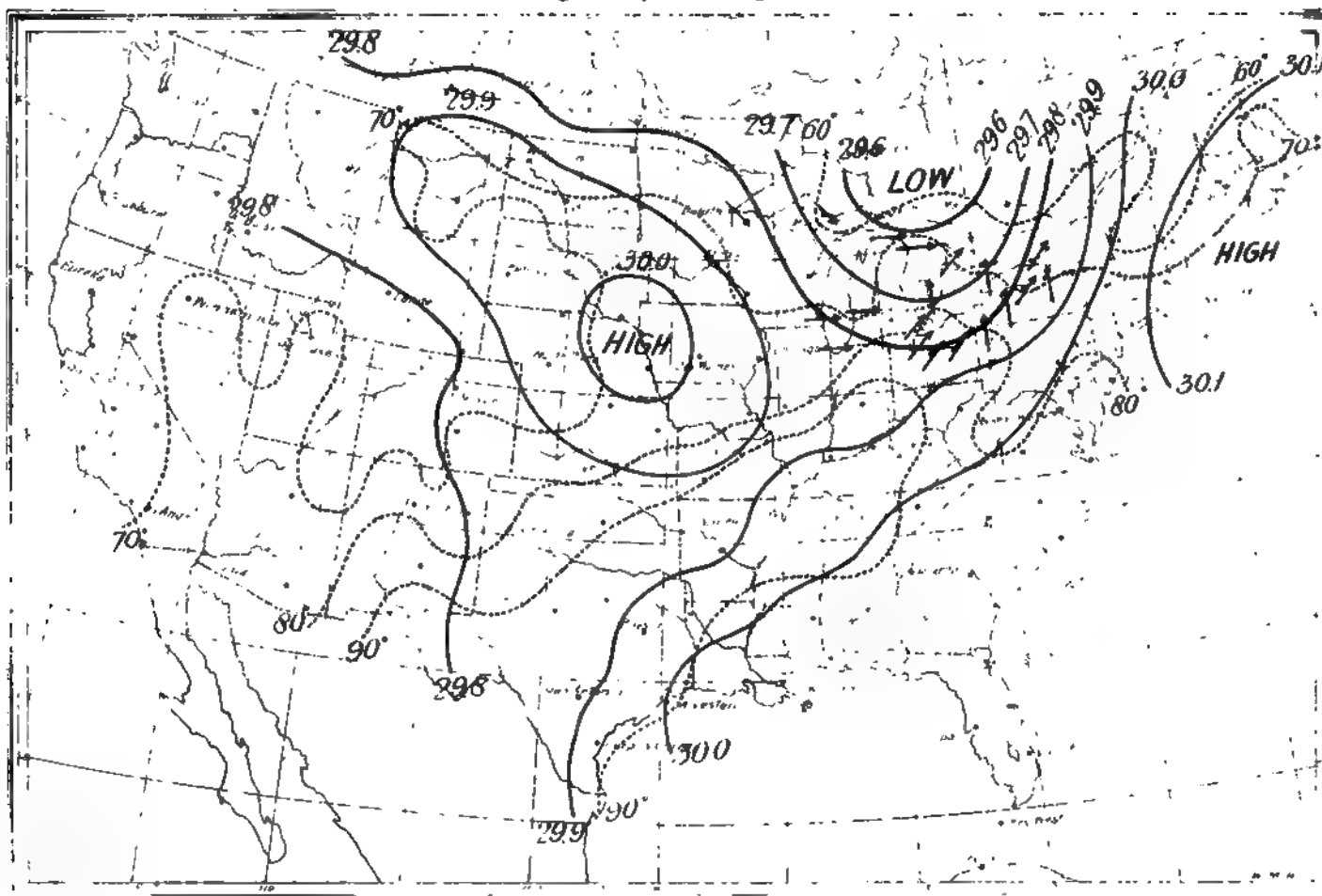


Chart CCCCCXV.

August 19, 1889—8 p. m.

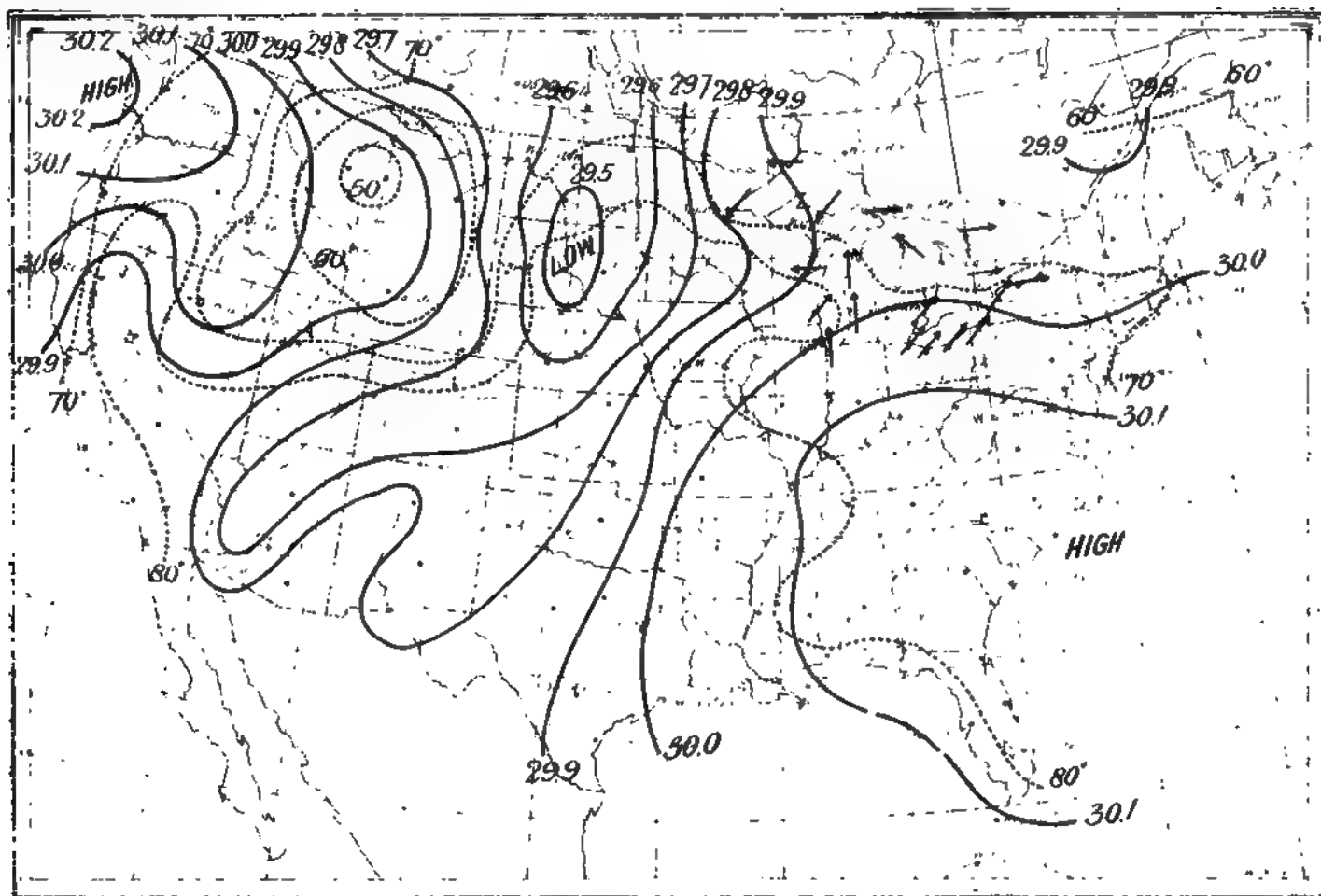


Chart CCCCCXVI.

August 20, 1889—8 a. m.

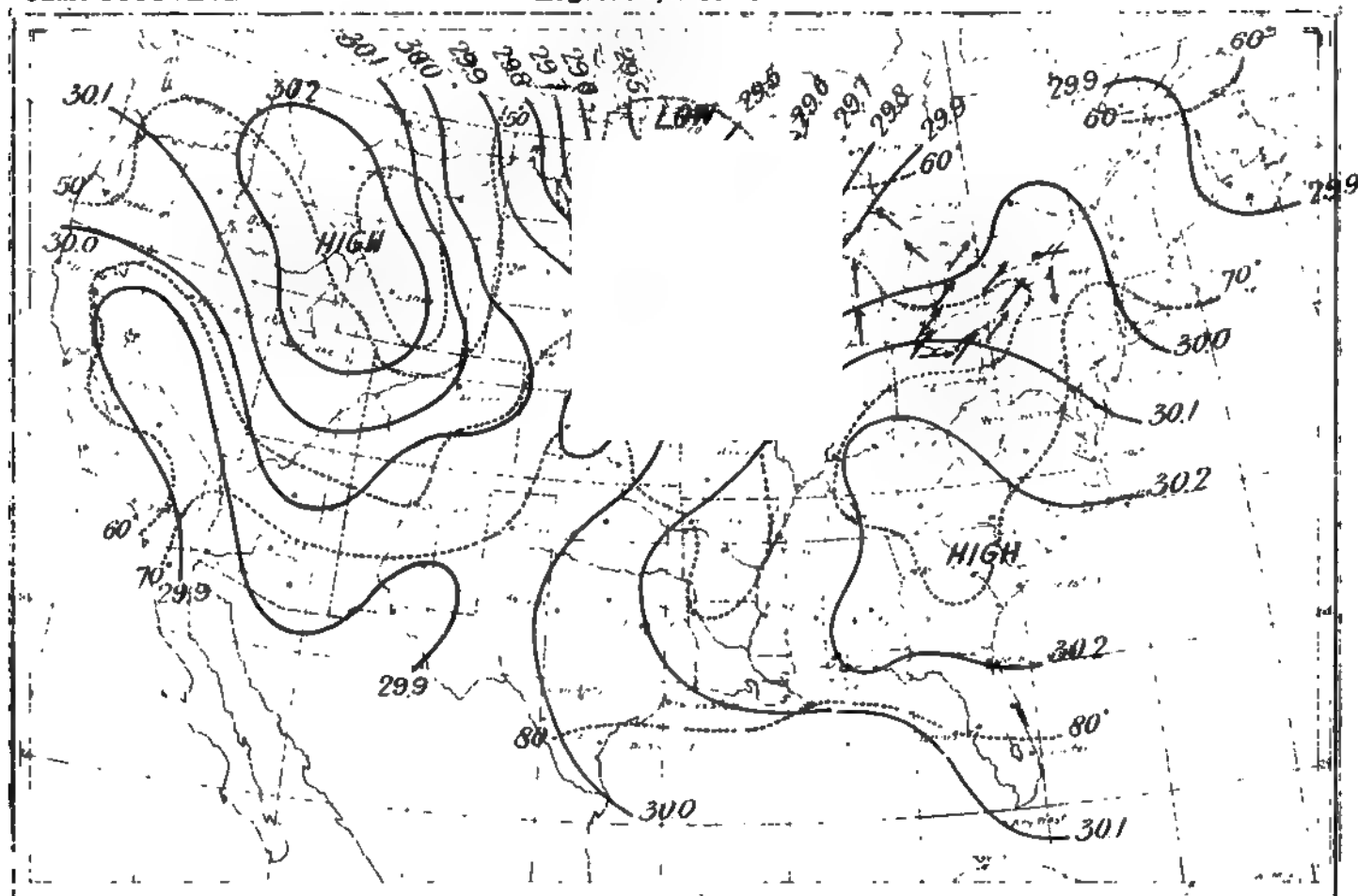


Chart CCCCCXVII.

August 20, 1889—8 p. m.

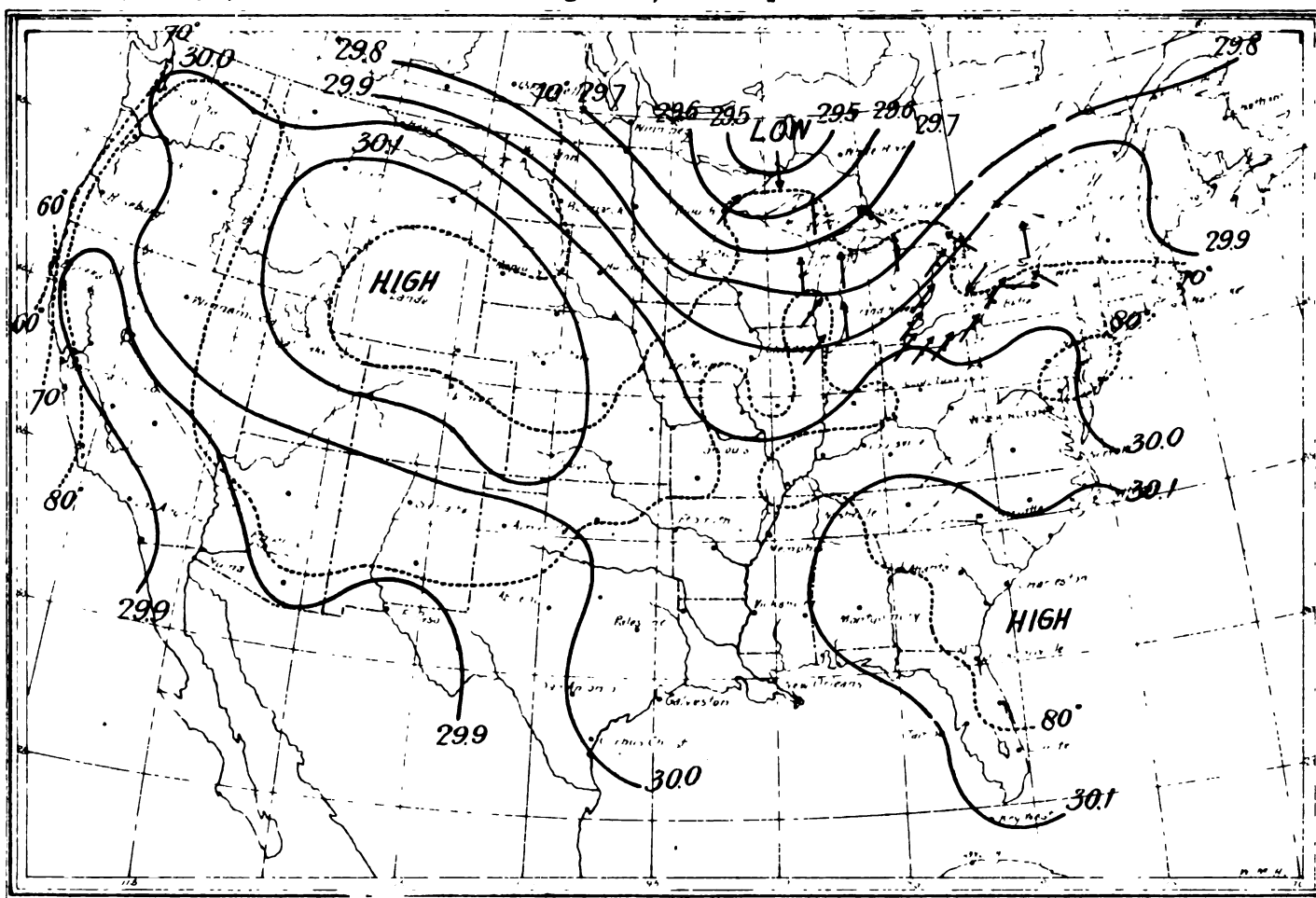


Chart CCCCCXVIII.

August 21, 1889—8 a. m.

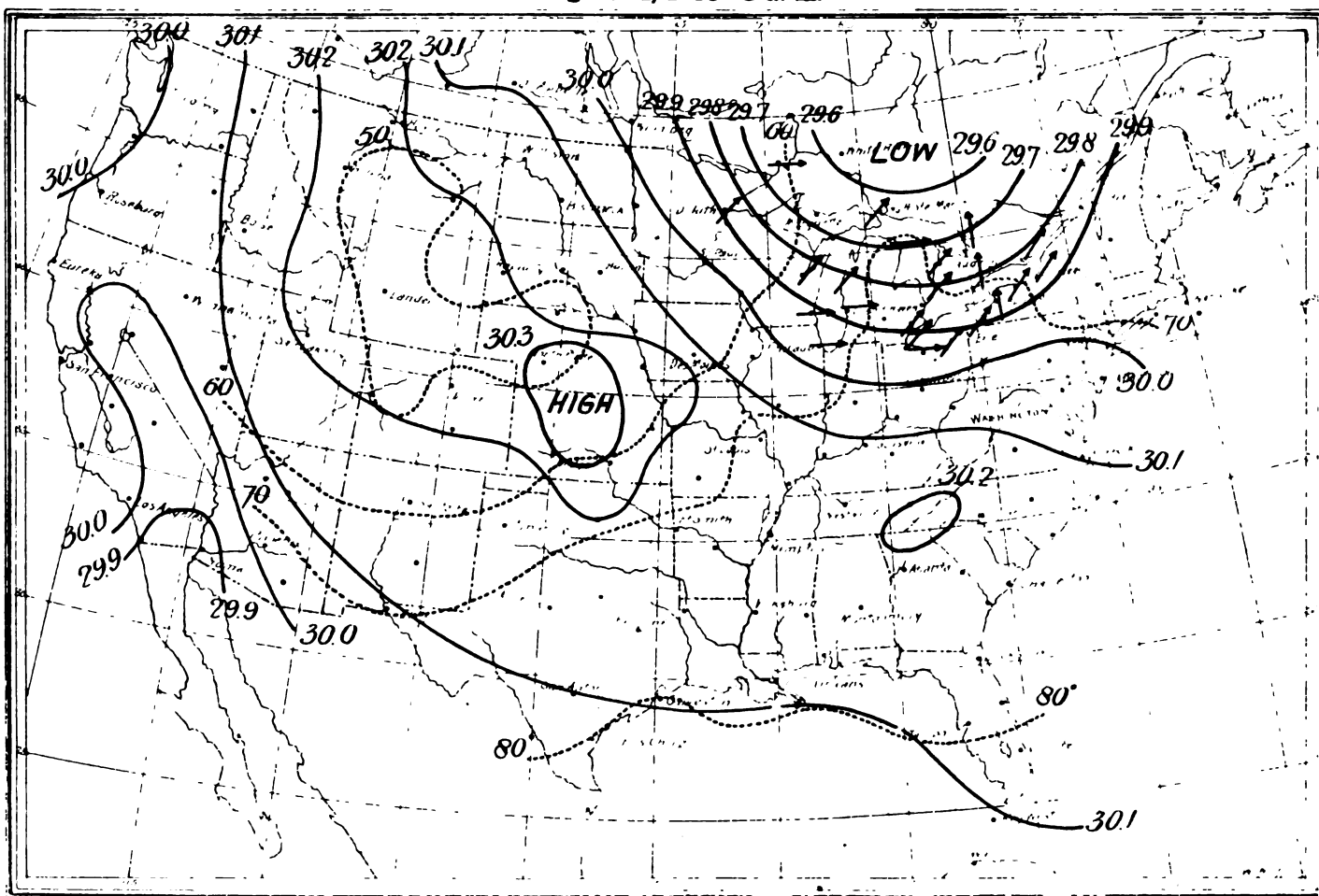


Chart CCCCXXIX.

August 16, 1891—8 a. m.

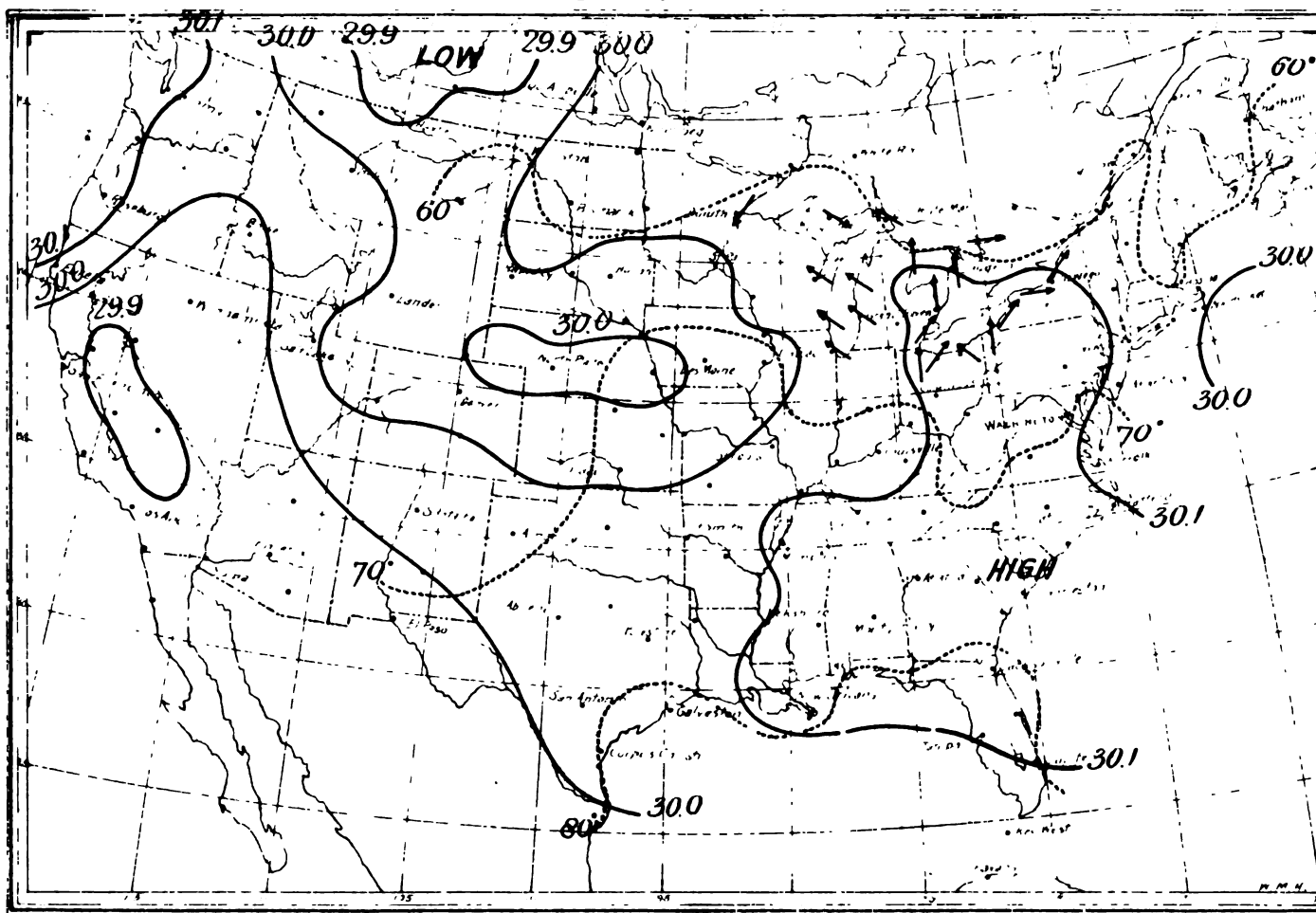


Chart CCCCXXX.

August 16, 1891—8 p. m.

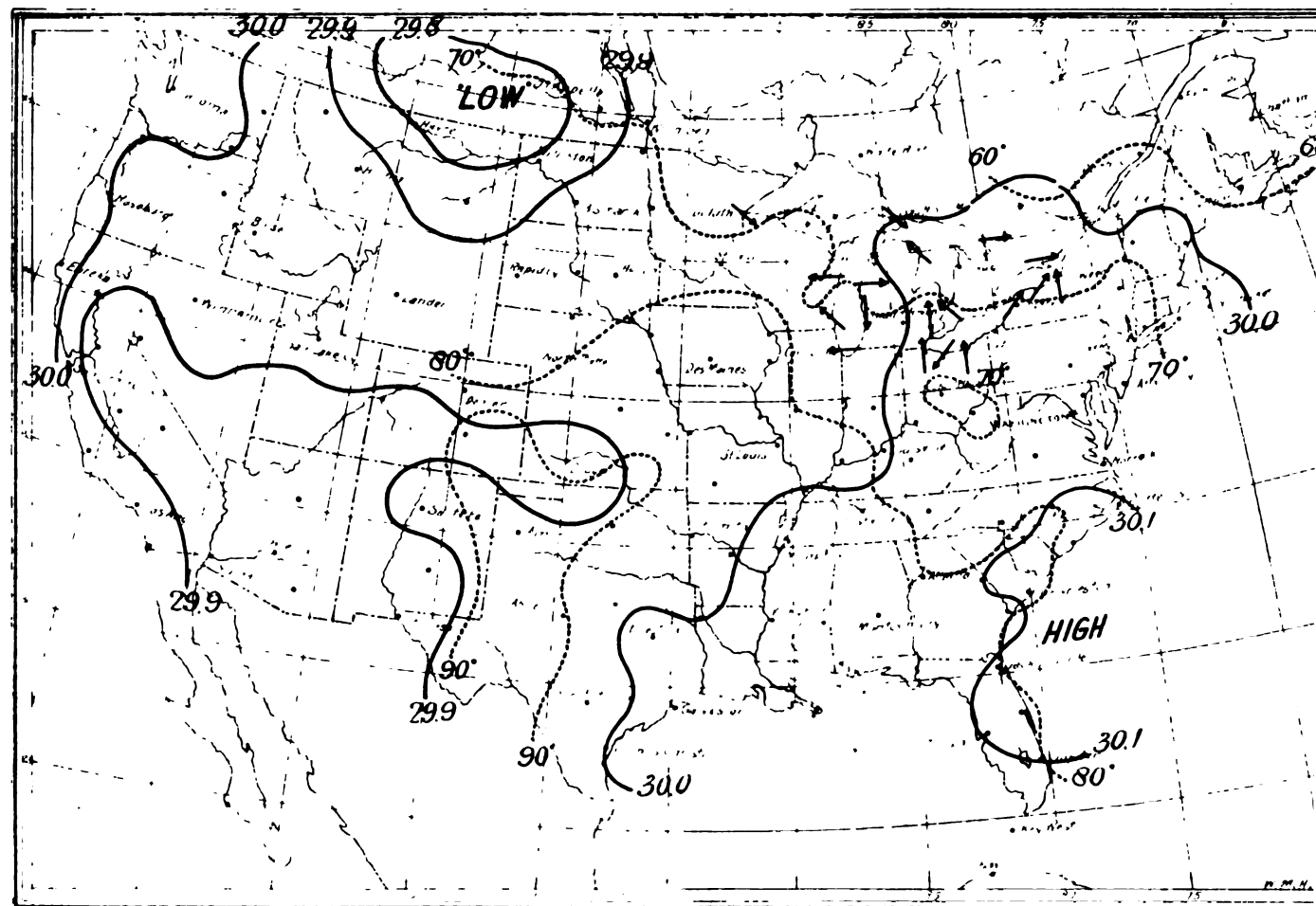


Chart OOOOXXXI.

August 17, 1891—8 a. m.

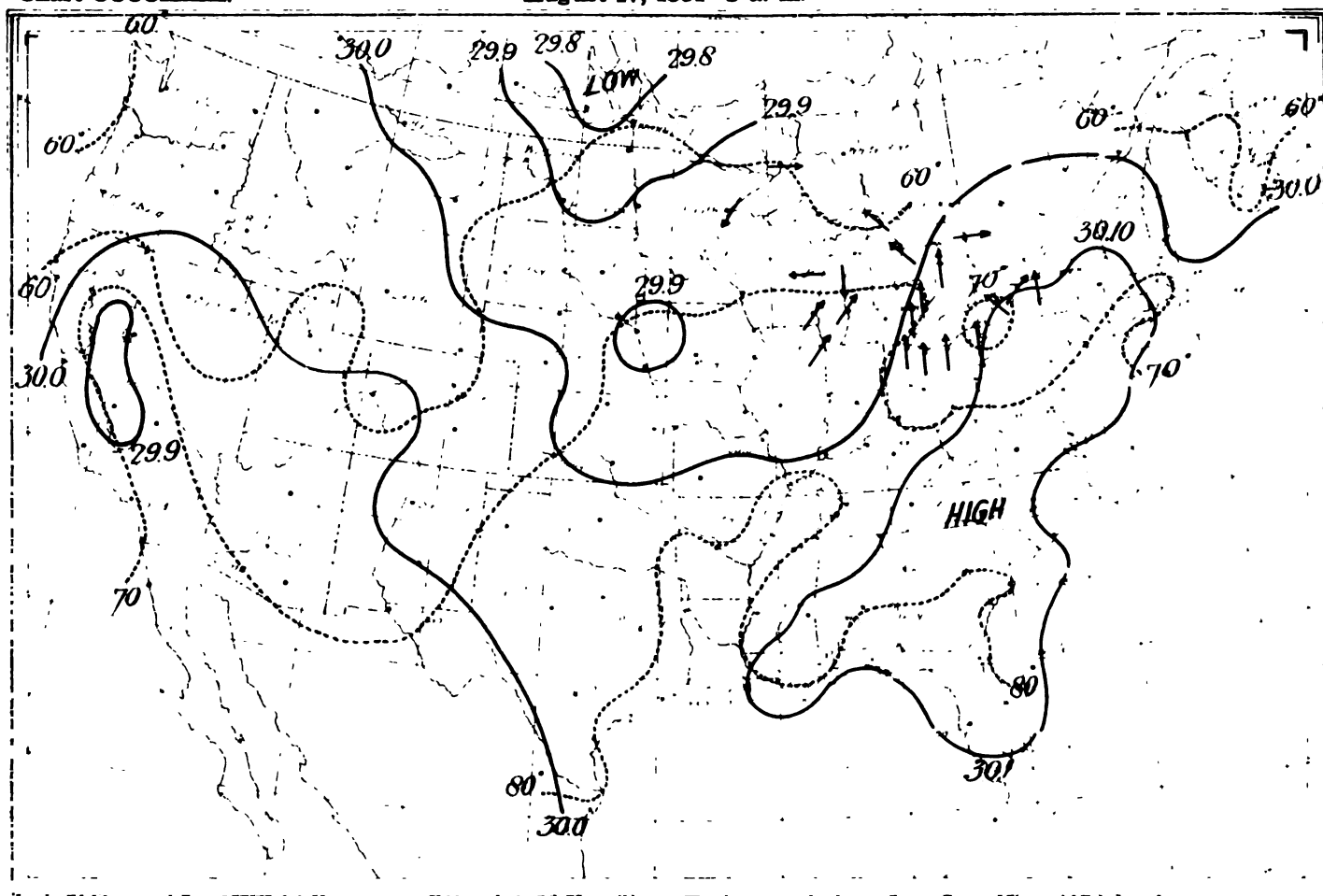


Chart OOOOXXXII.

August 17, 1891—8 p. m.

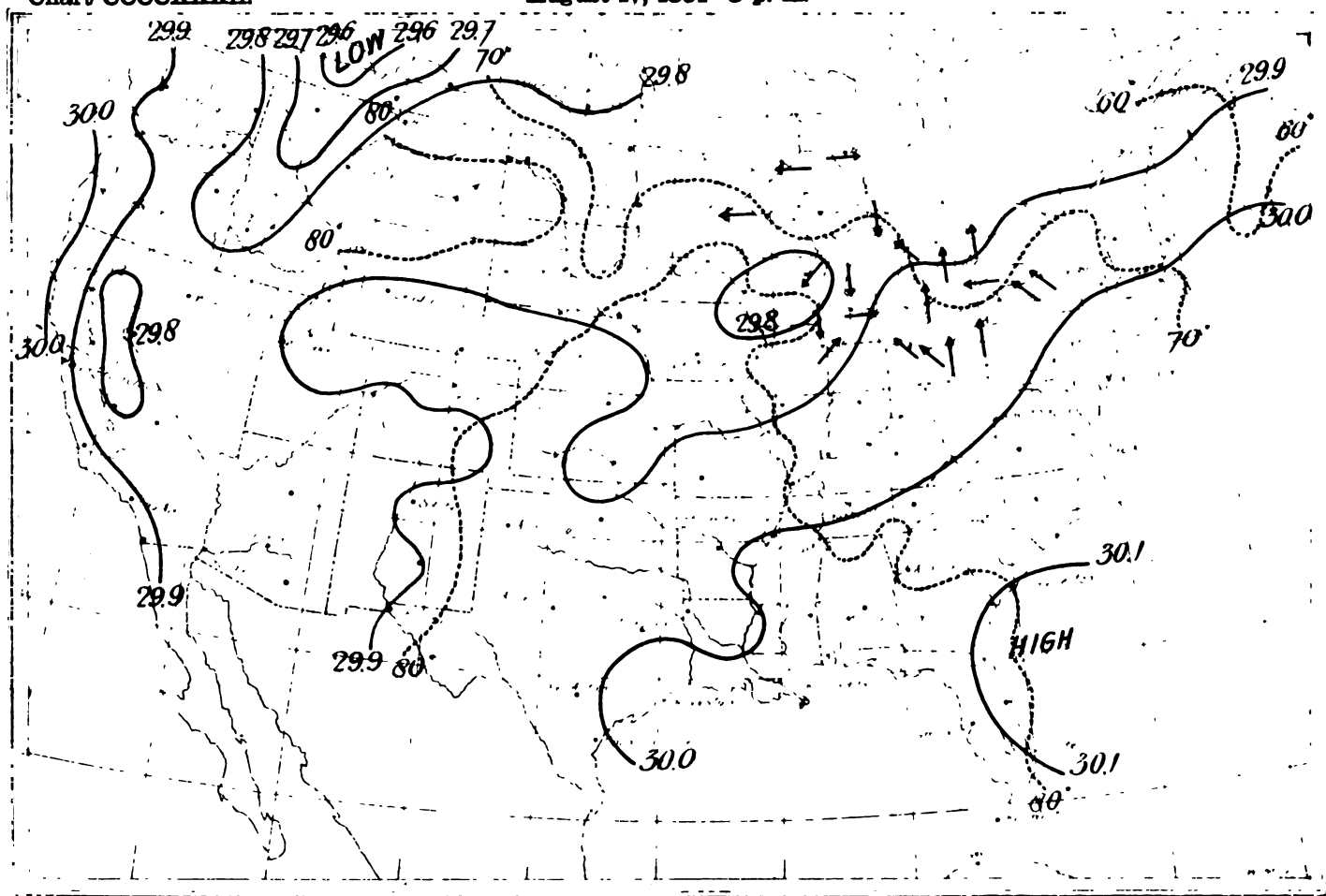


Chart OOOOXXXIII.

August 29, 1892—8 a. m.

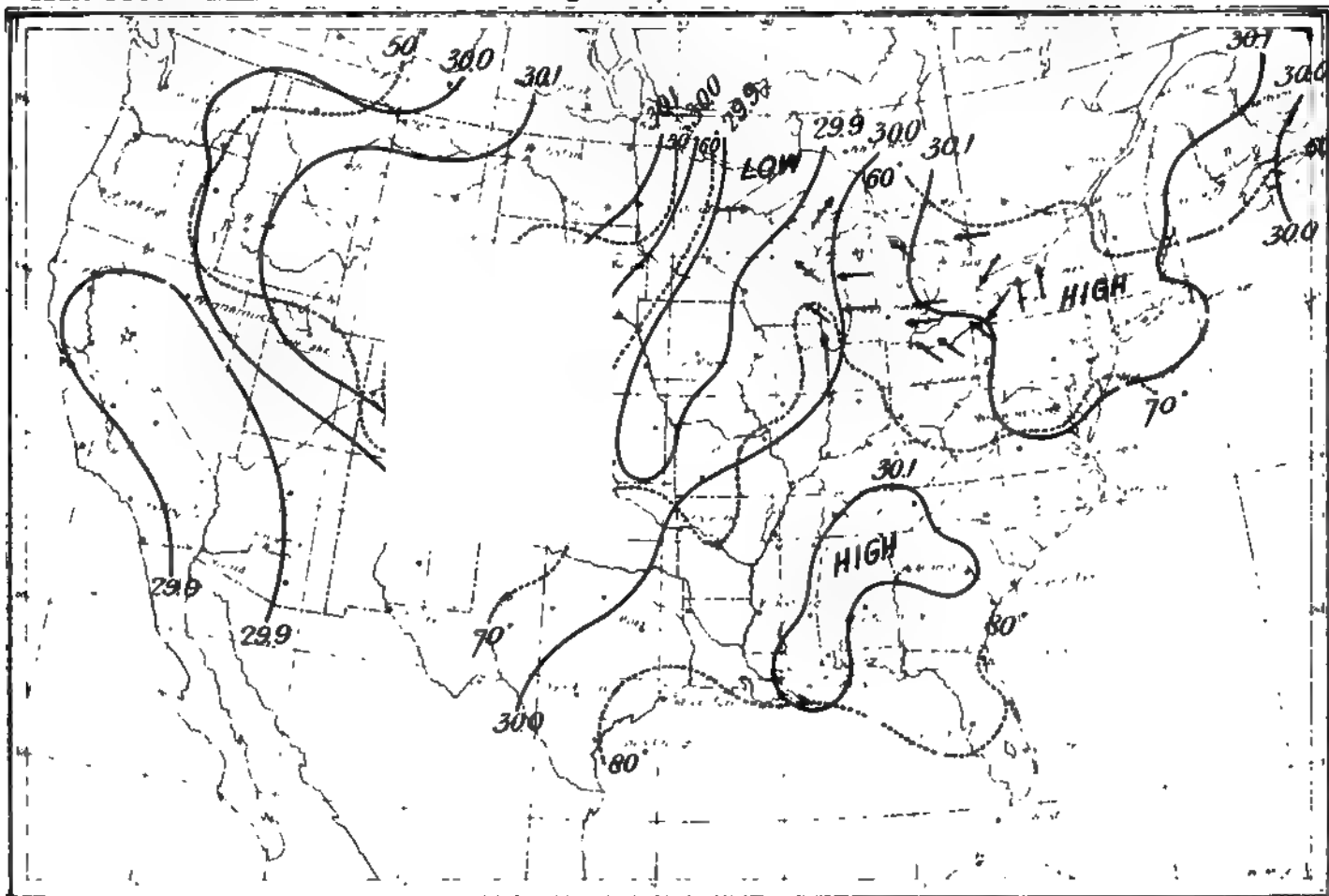


Chart OOOOXXXIV.

August 29, 1892—8 p. m.

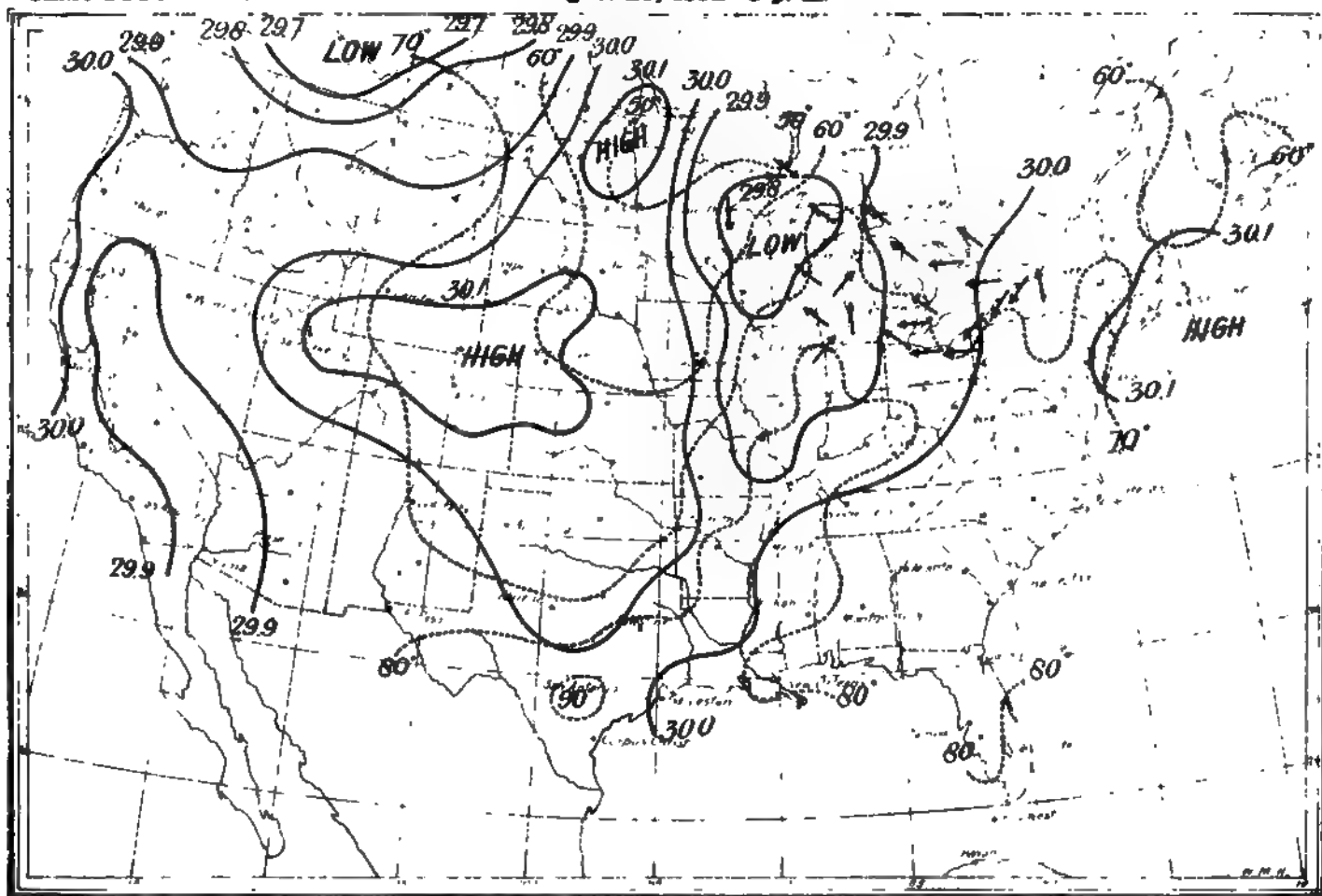


Chart 0000XXXV.

August 30, 1892—8 a. m.

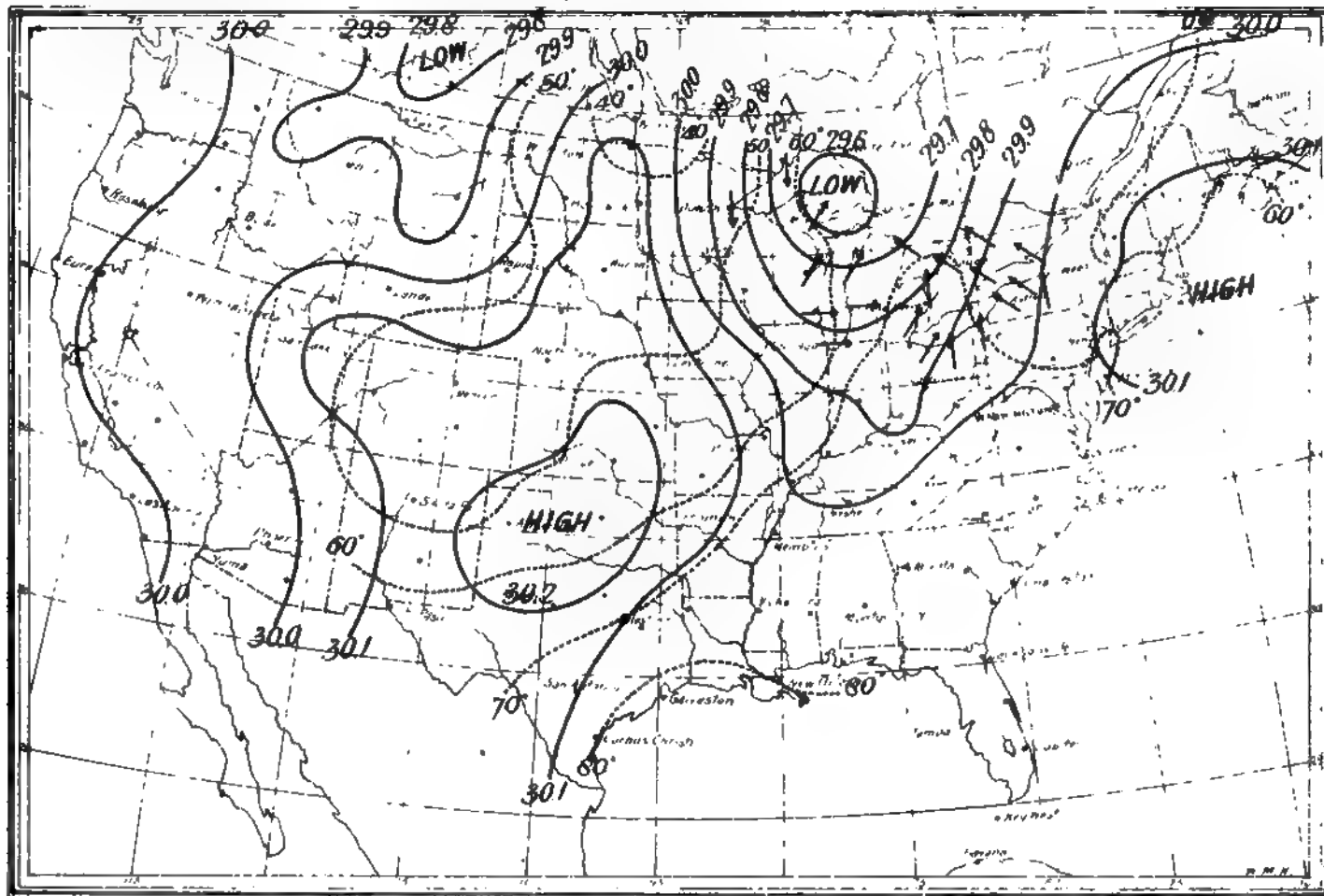


Chart 0000XXXVI.

August 30, 1892—8 p. m.

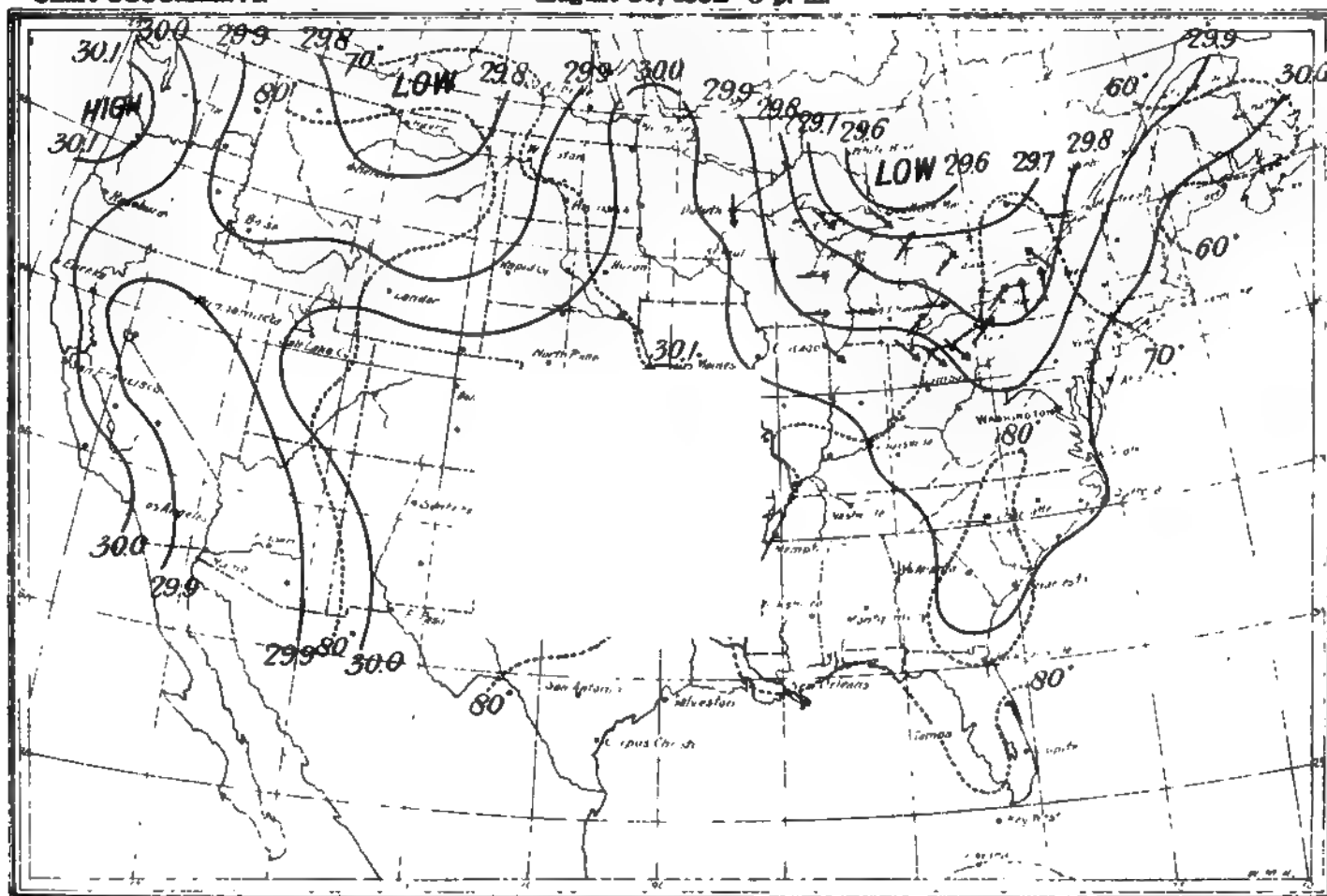


Chart CCCCCXXVII.

August 28, 1898—8 a. m.

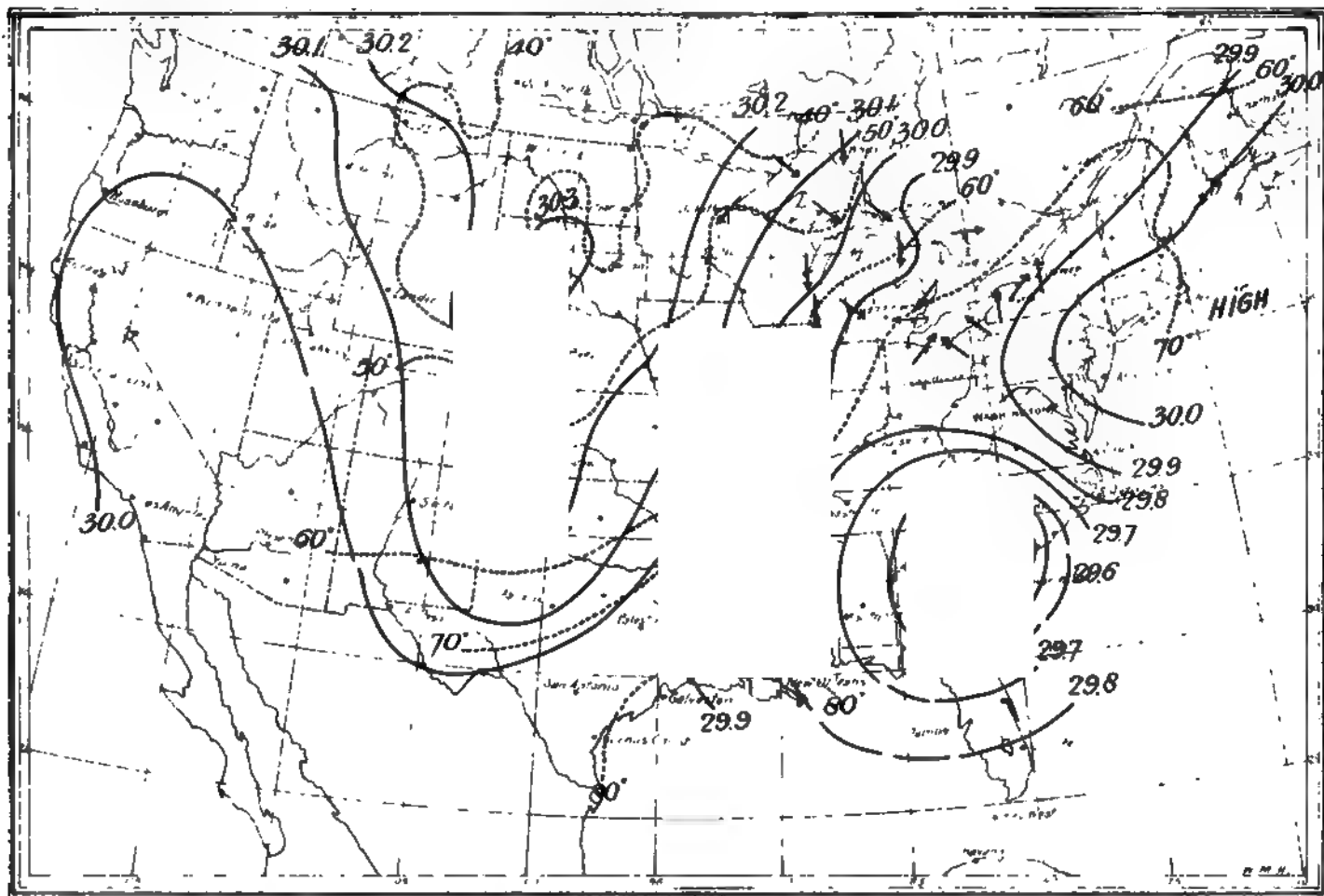


Chart CCCCCXXVIII.

August 28, 1898—8 p. m.

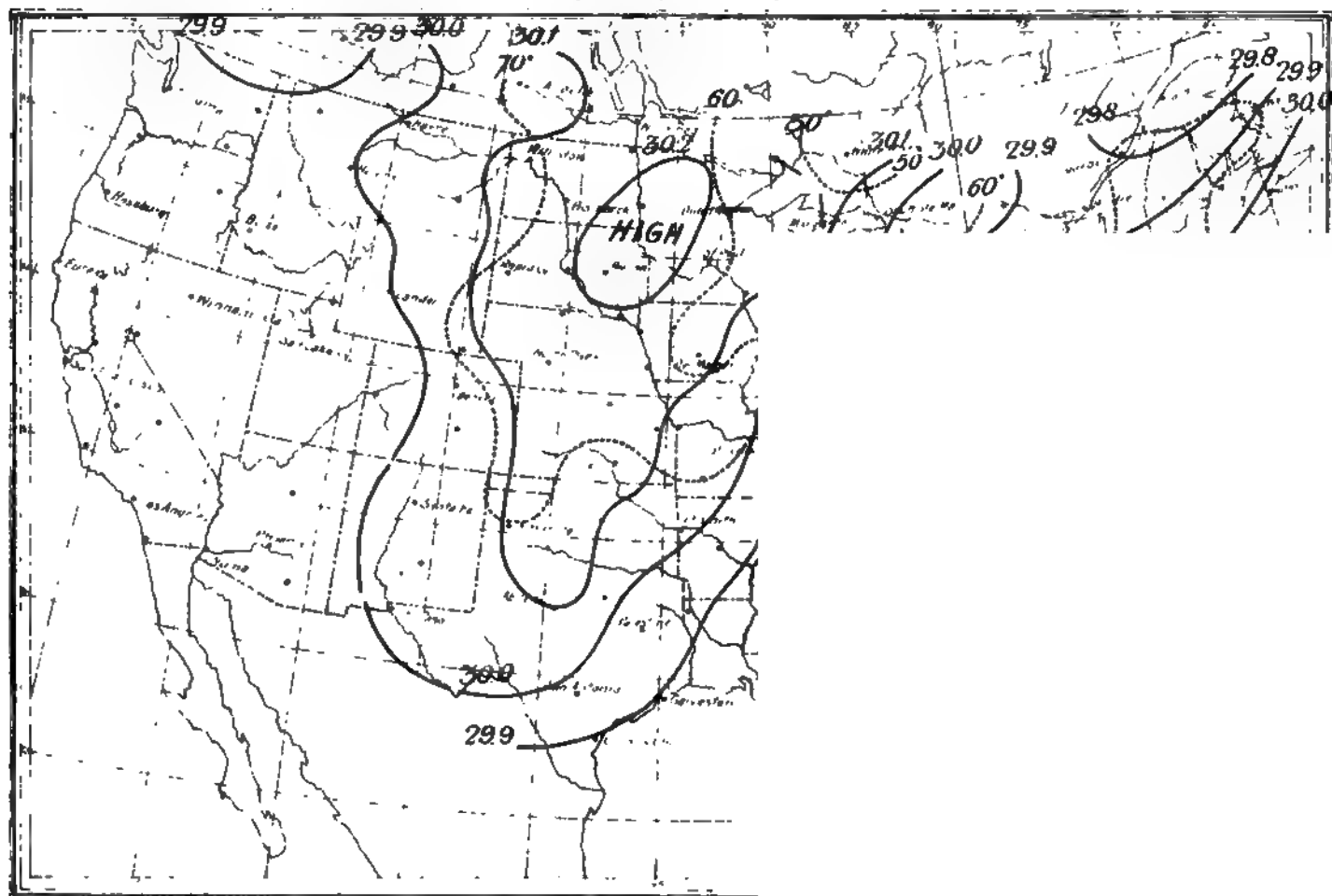


Chart 0000XXXXX

August 29, 1898—8 a. m.

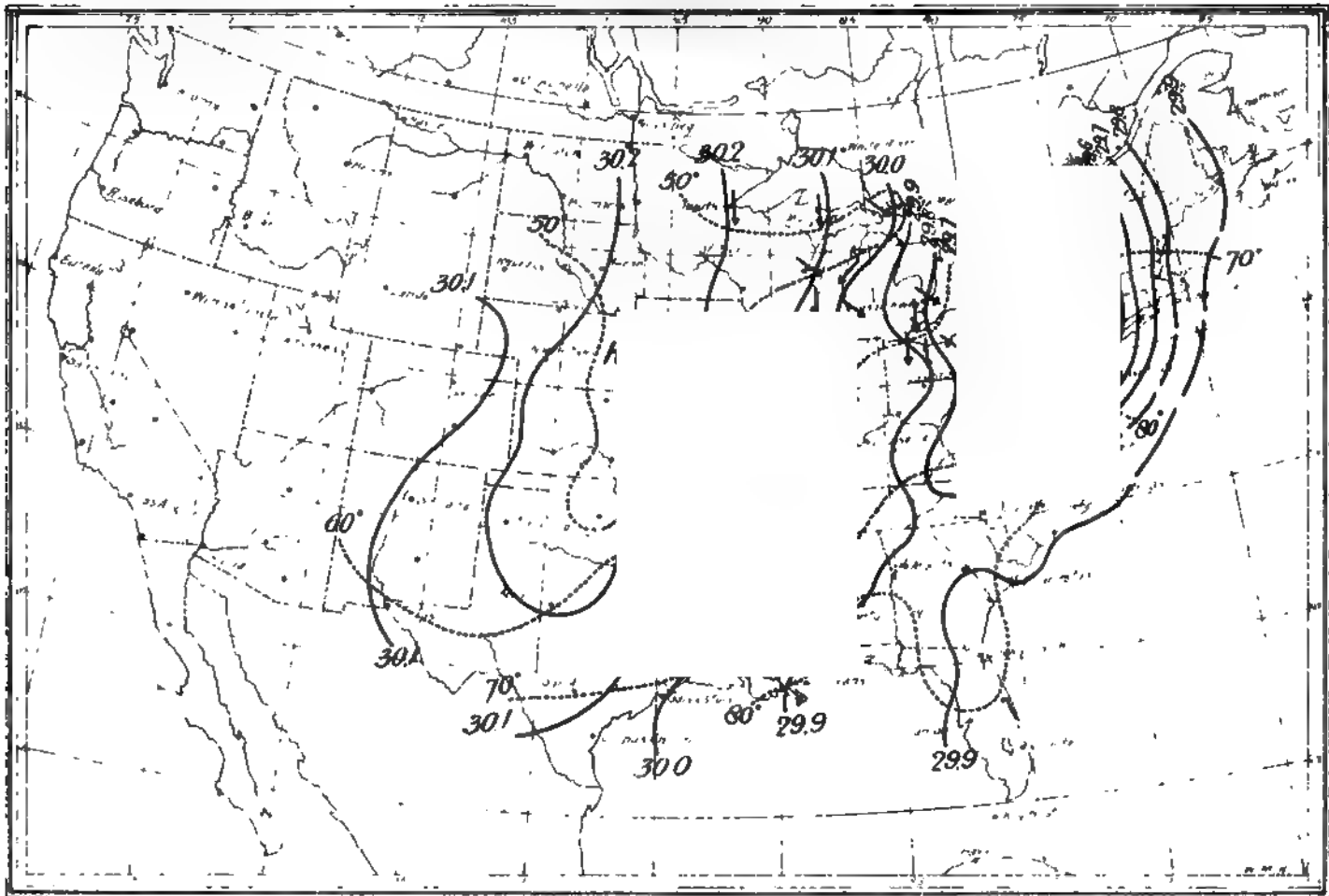


Chart 0000XXI.

August 29, 1898—8 p. m.

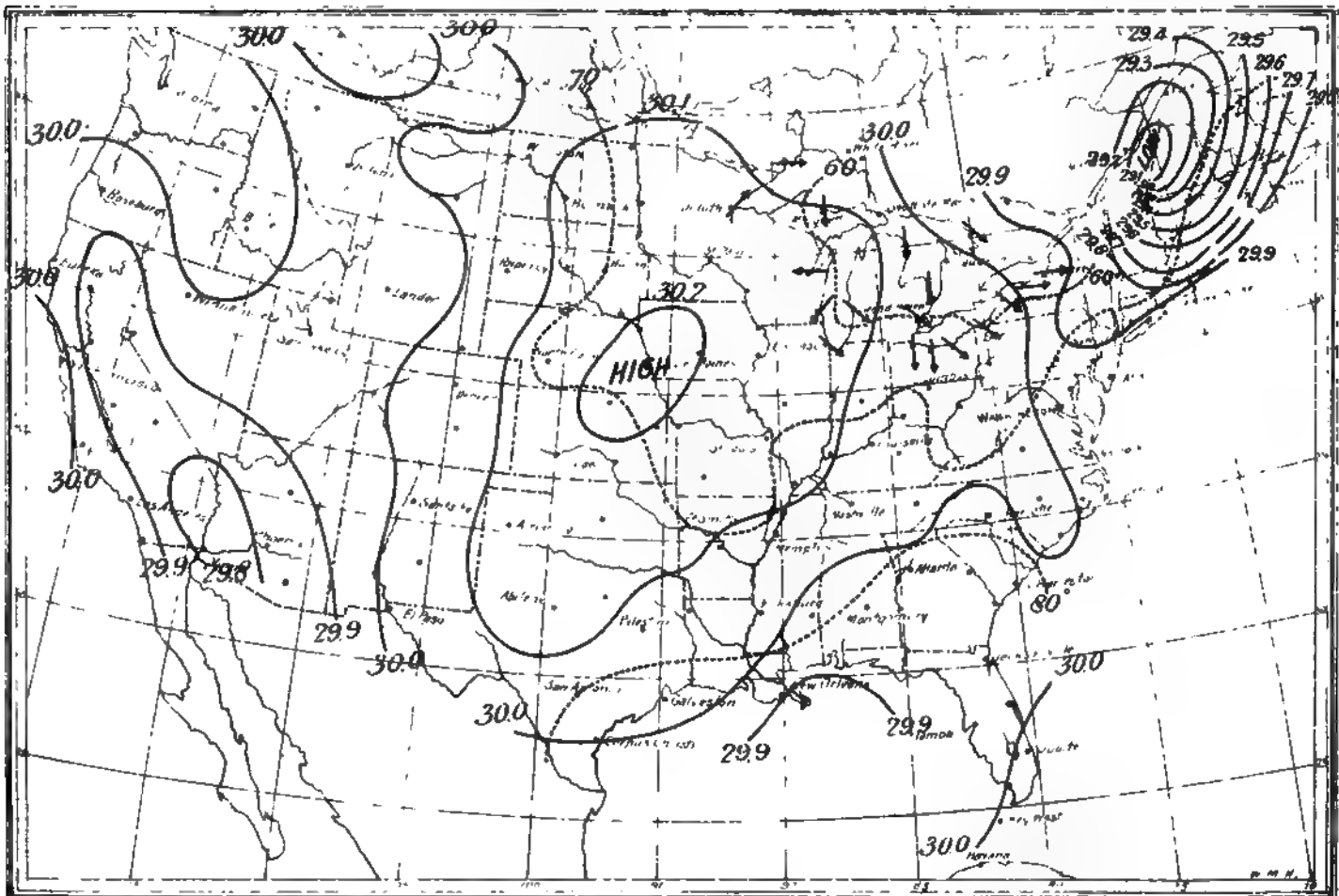


Chart CCCCXLI

September 17, 1876—7:35 a. m.

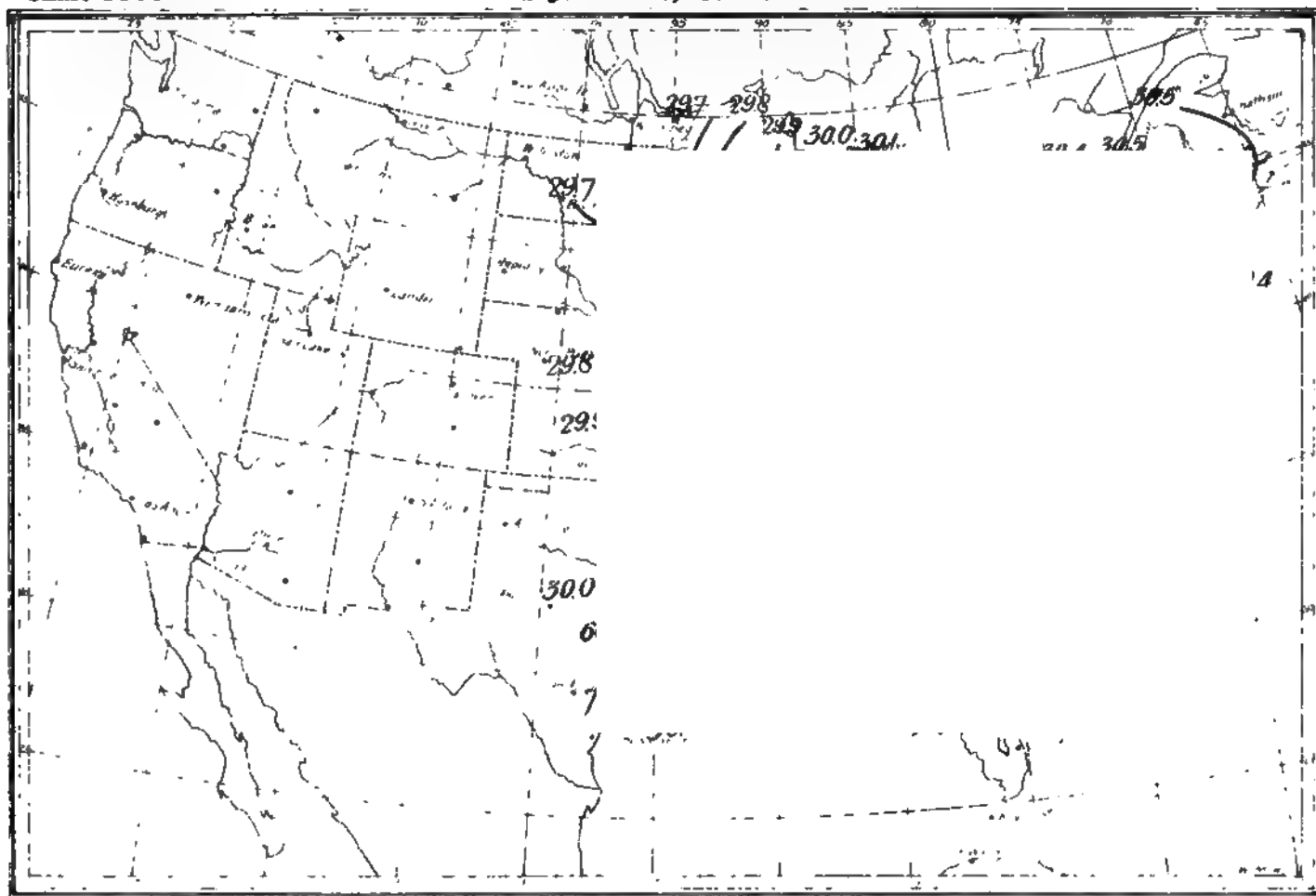


Chart CCCCXLII

September 17, 1876—4:35 p. m.

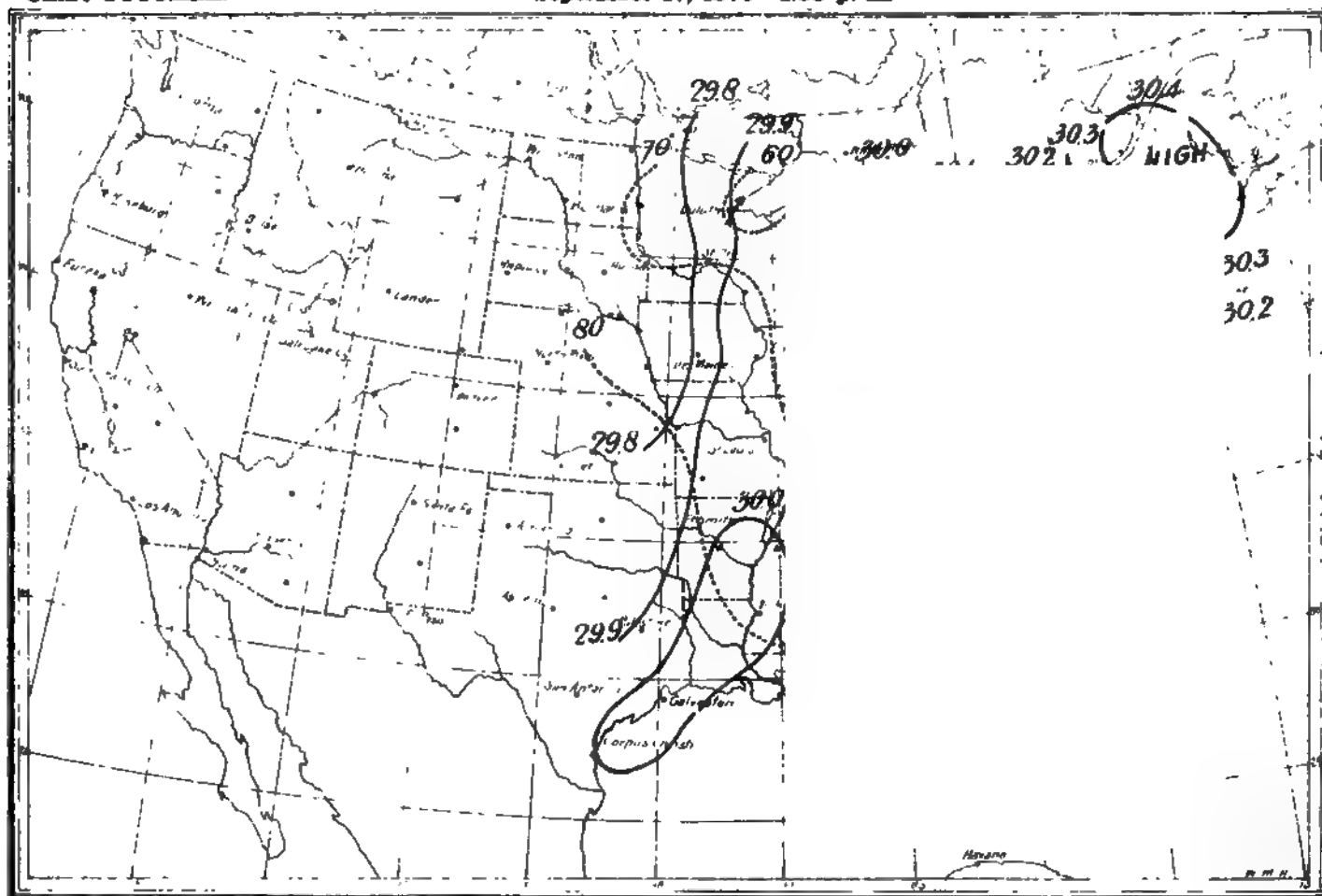


Chart OOOOXLIII.

September 18, 1876—7:35 a. m.

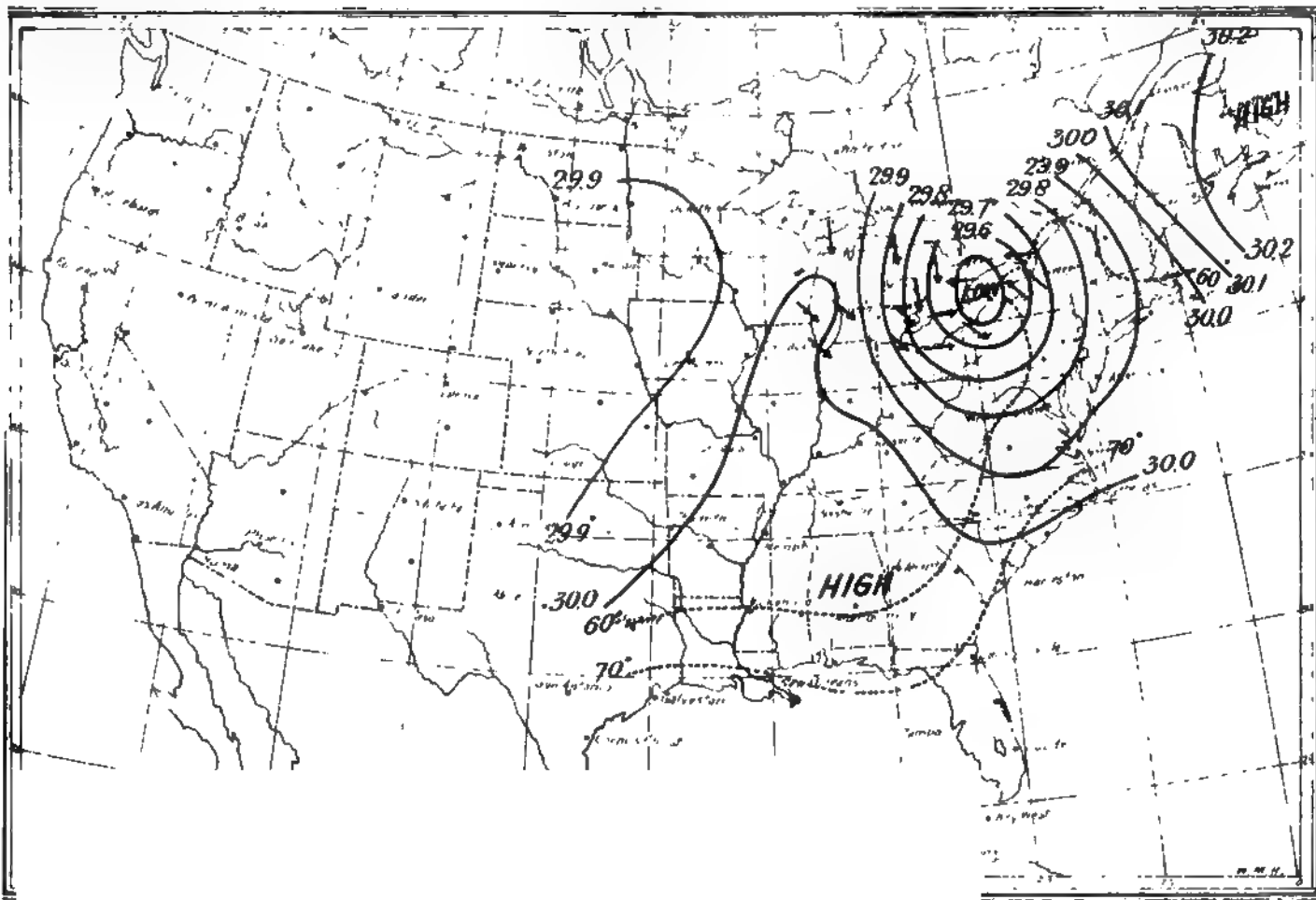


Chart OOOOXLIV.

September 18, 1876—4:35 p. m.

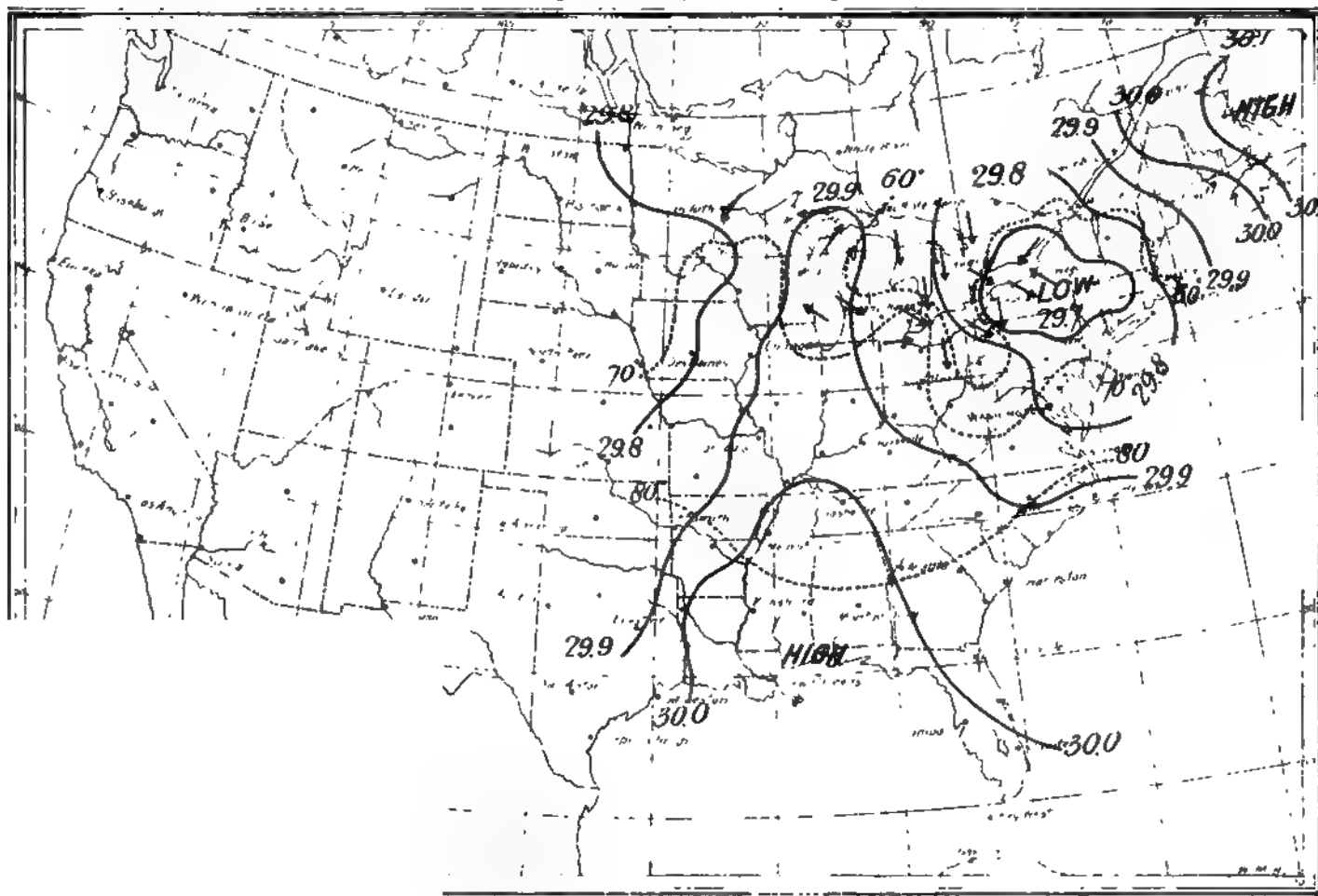


Chart OOOXLV.

September 12, 1878—7:35 a. m.

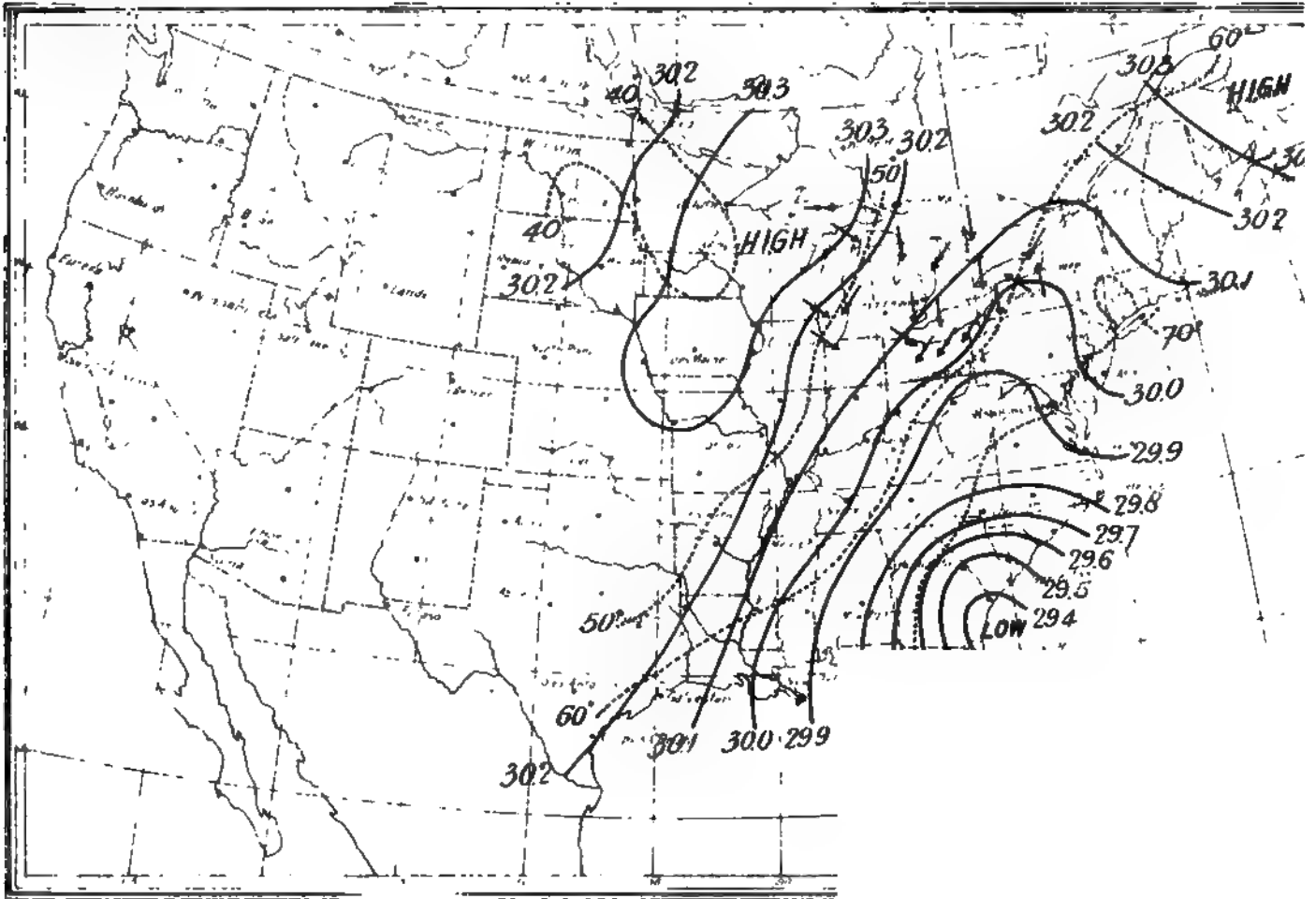


Chart OOOXLVI.

September 12, 1878—4:35 p. m.

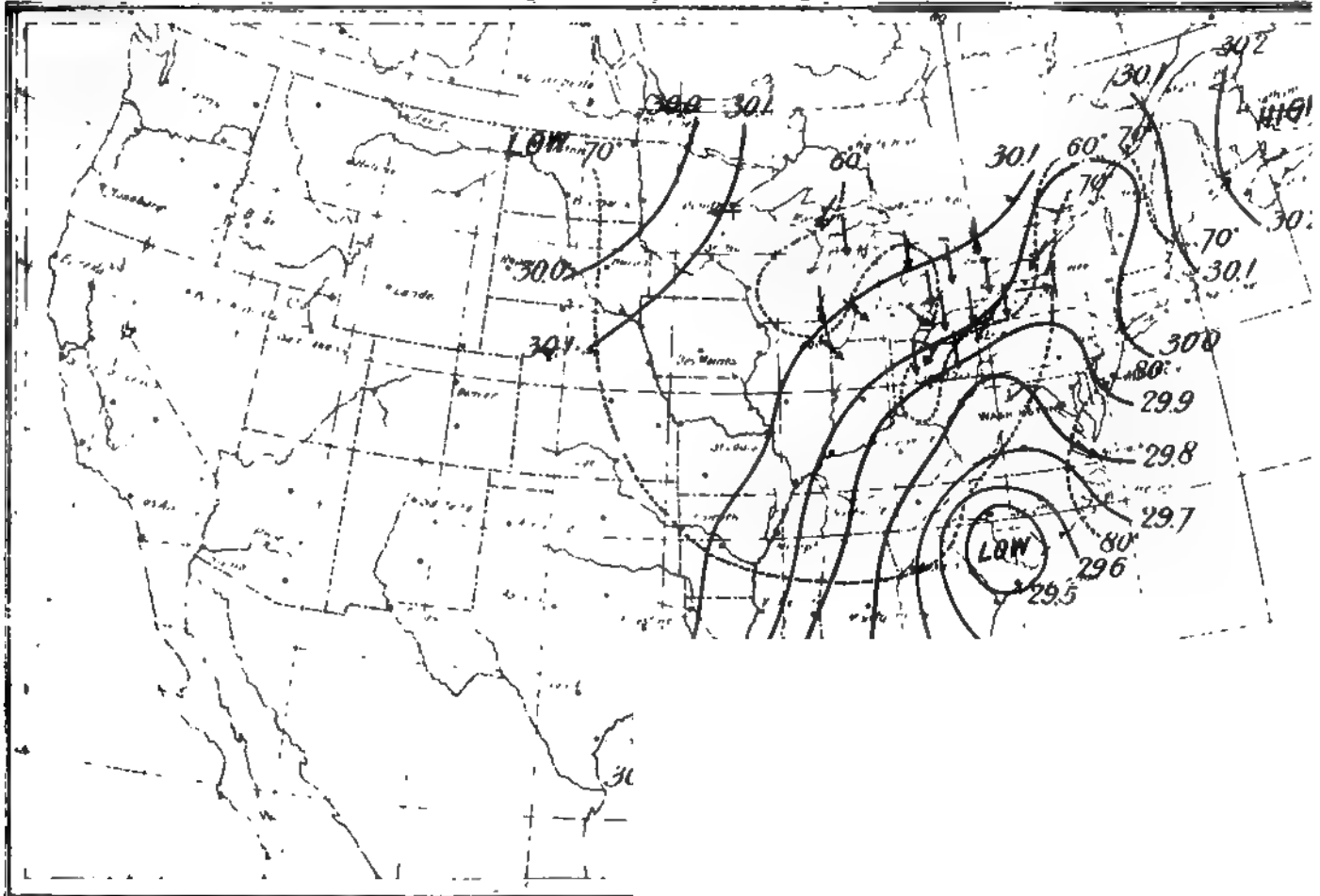


Chart 0000XLVII.

September 13, 1878—7:35 a. m.

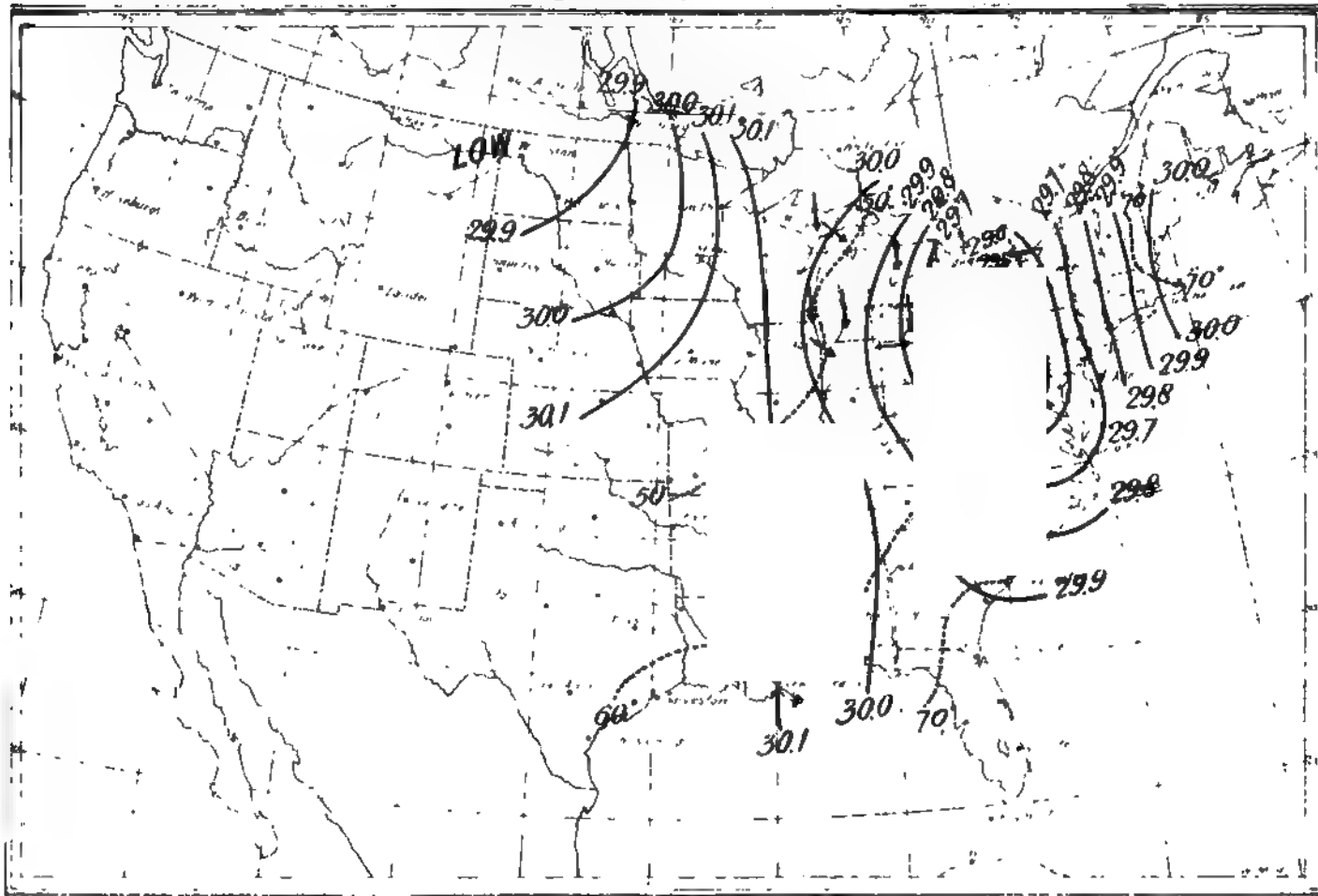


Chart 0000XLVIII.

September 13, 1878—4:35 p. m.

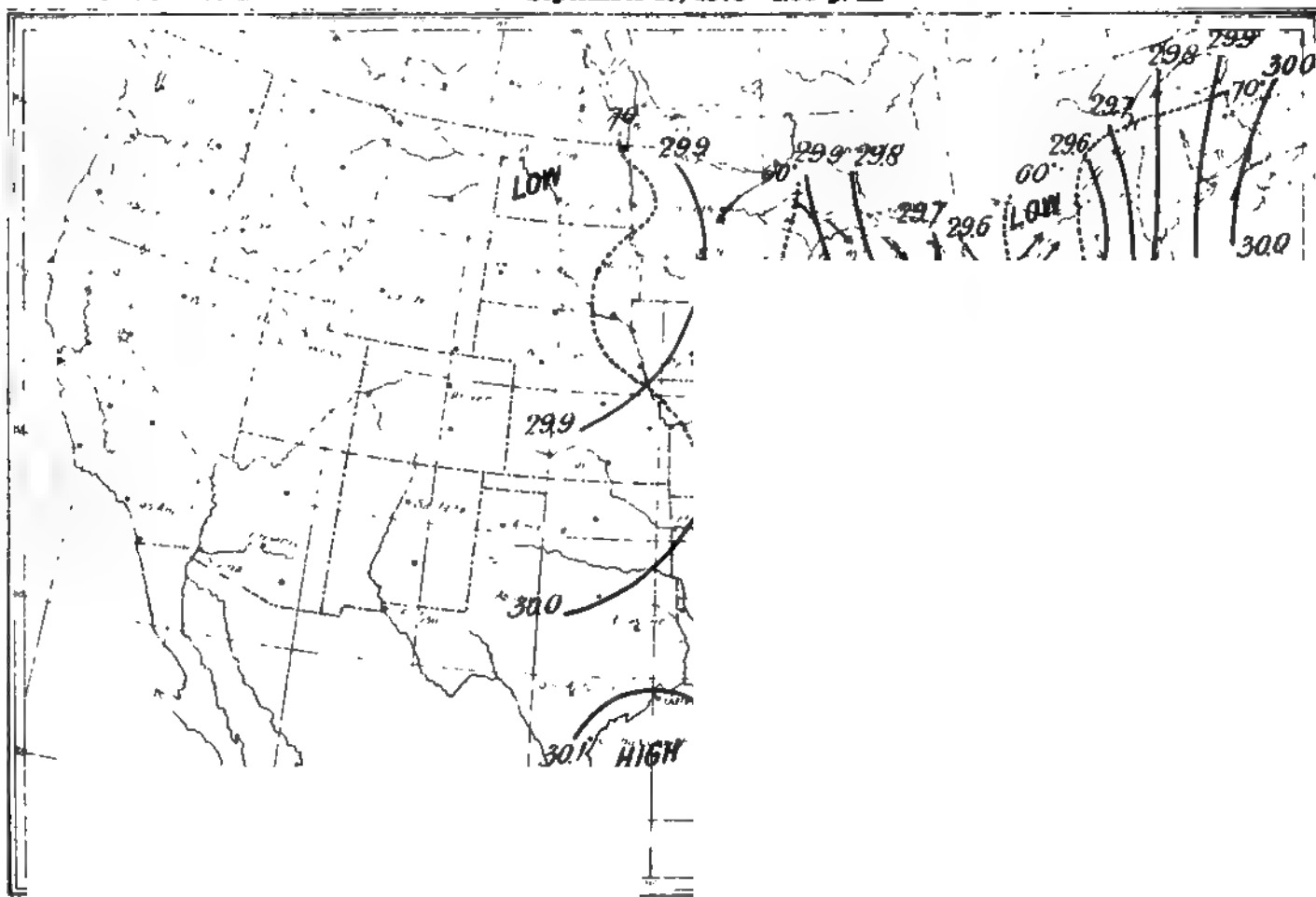


Chart OOOOXLIX.

September 10, 1878—7:35 a. m.

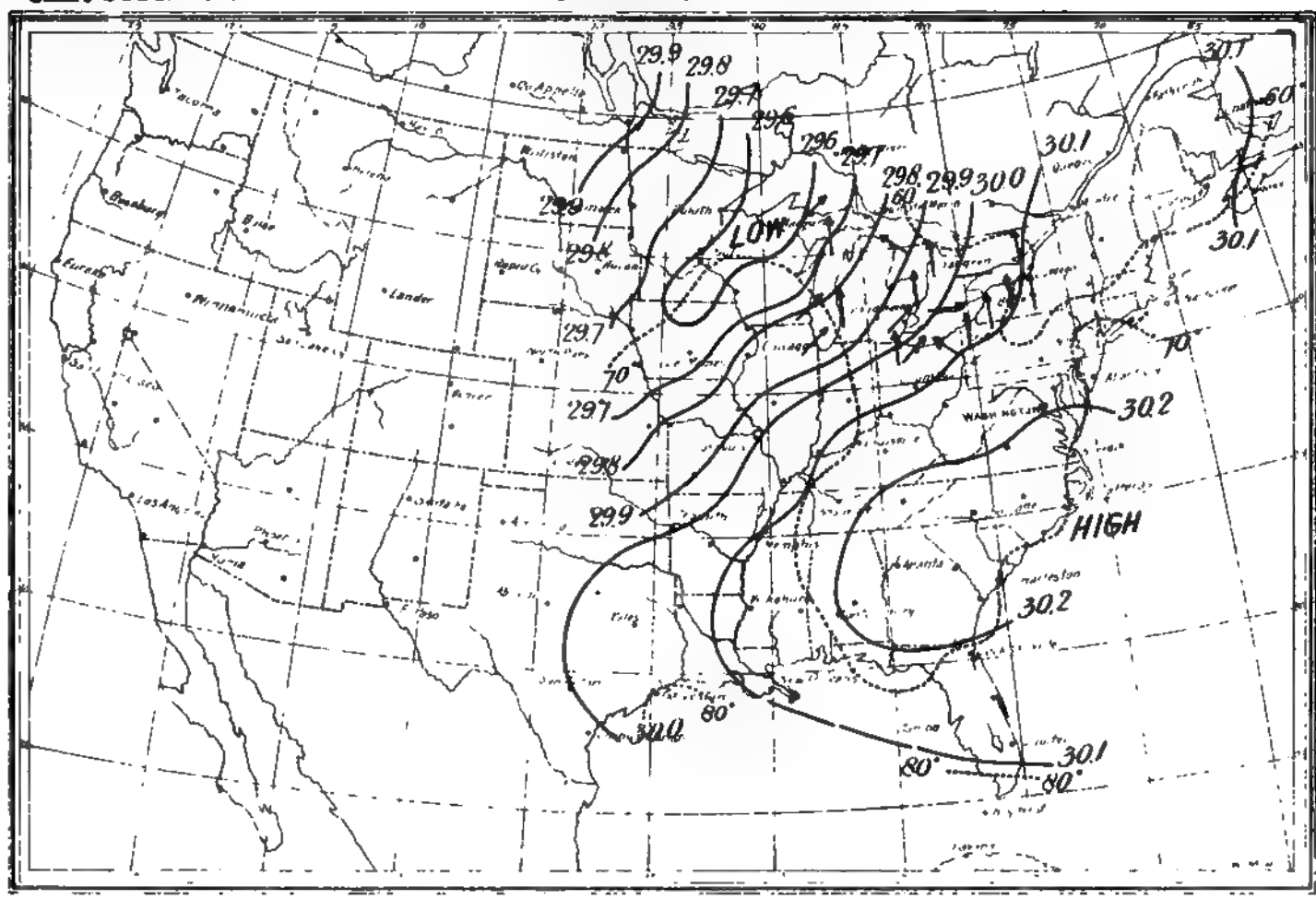


Chart OOOOOL.

September 10, 1878—4:35 p. m.

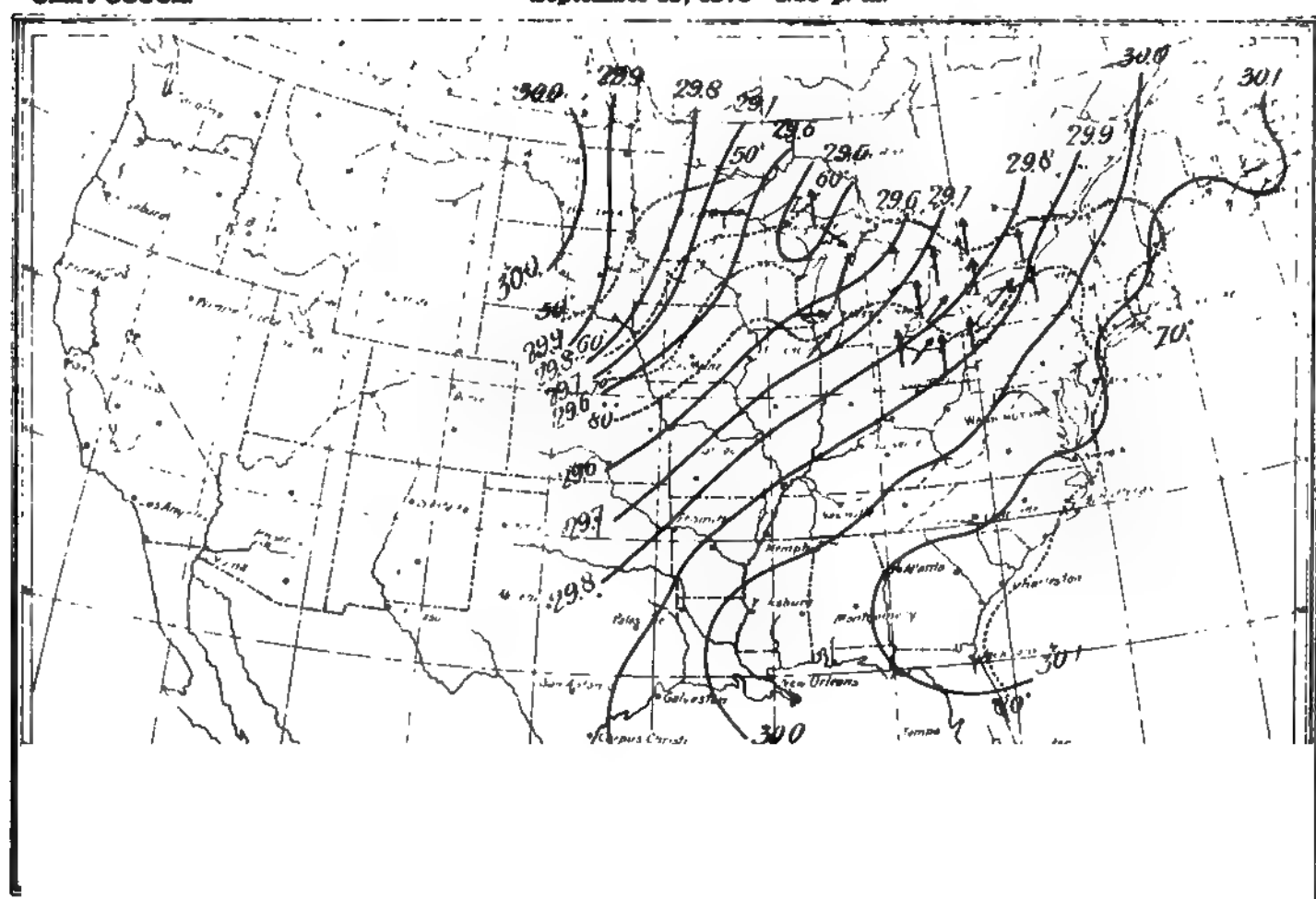


Chart 000011

September 20, 1878—7:35 a. m.

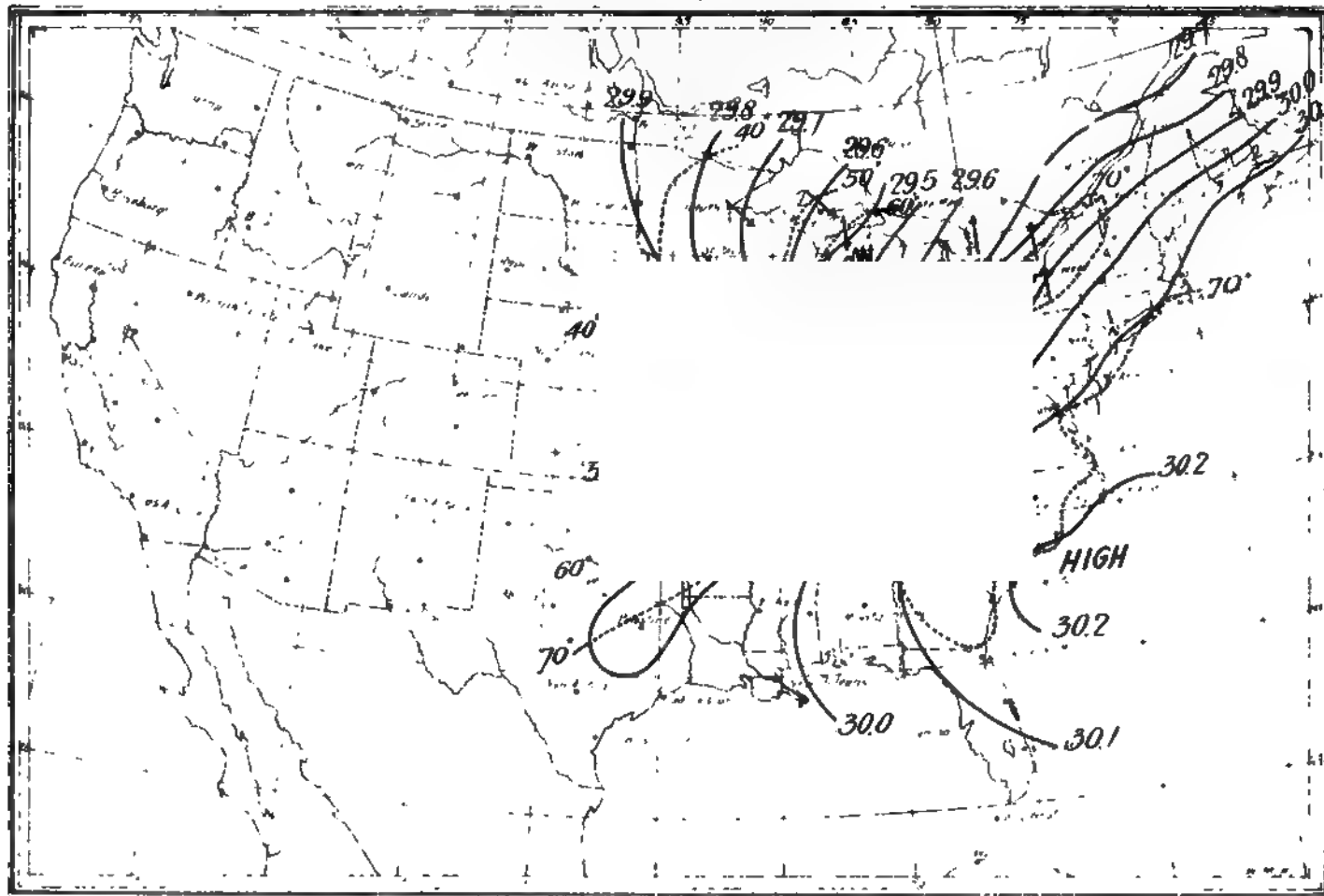


Chart 000011

September 20, 1878—4:35 p. m.

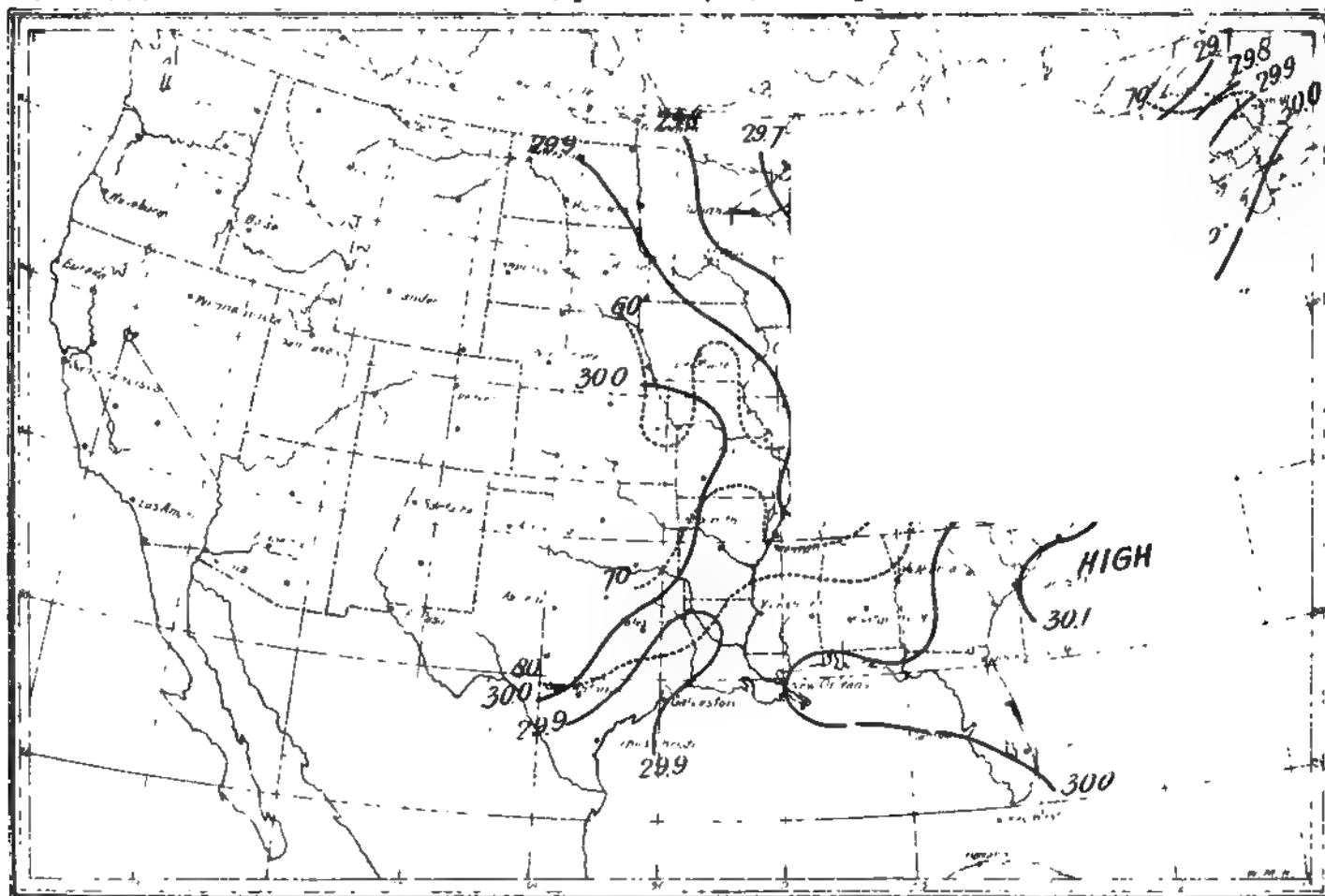


Chart 0000LIII.

September 2, 1879—7:35 a. m.

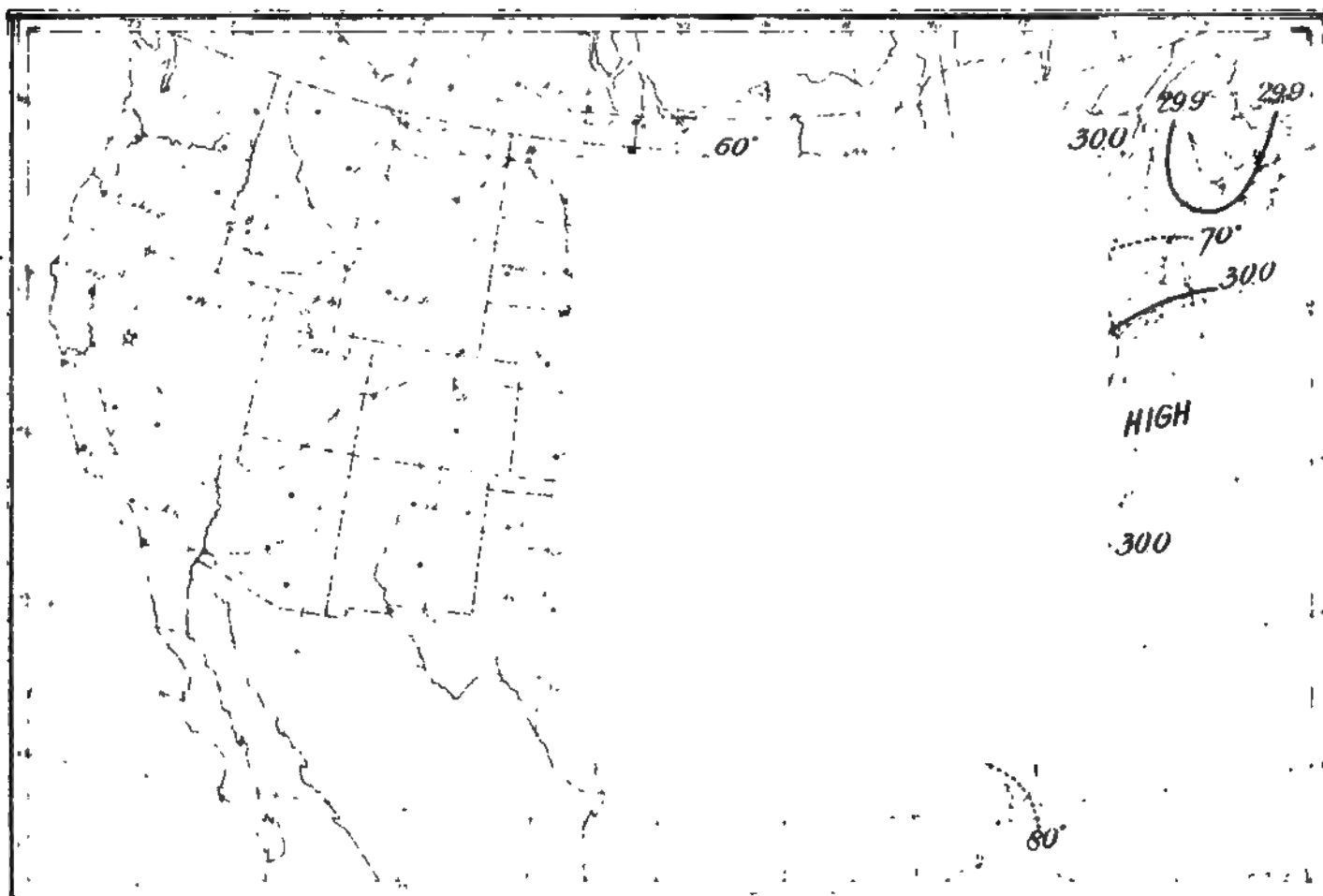
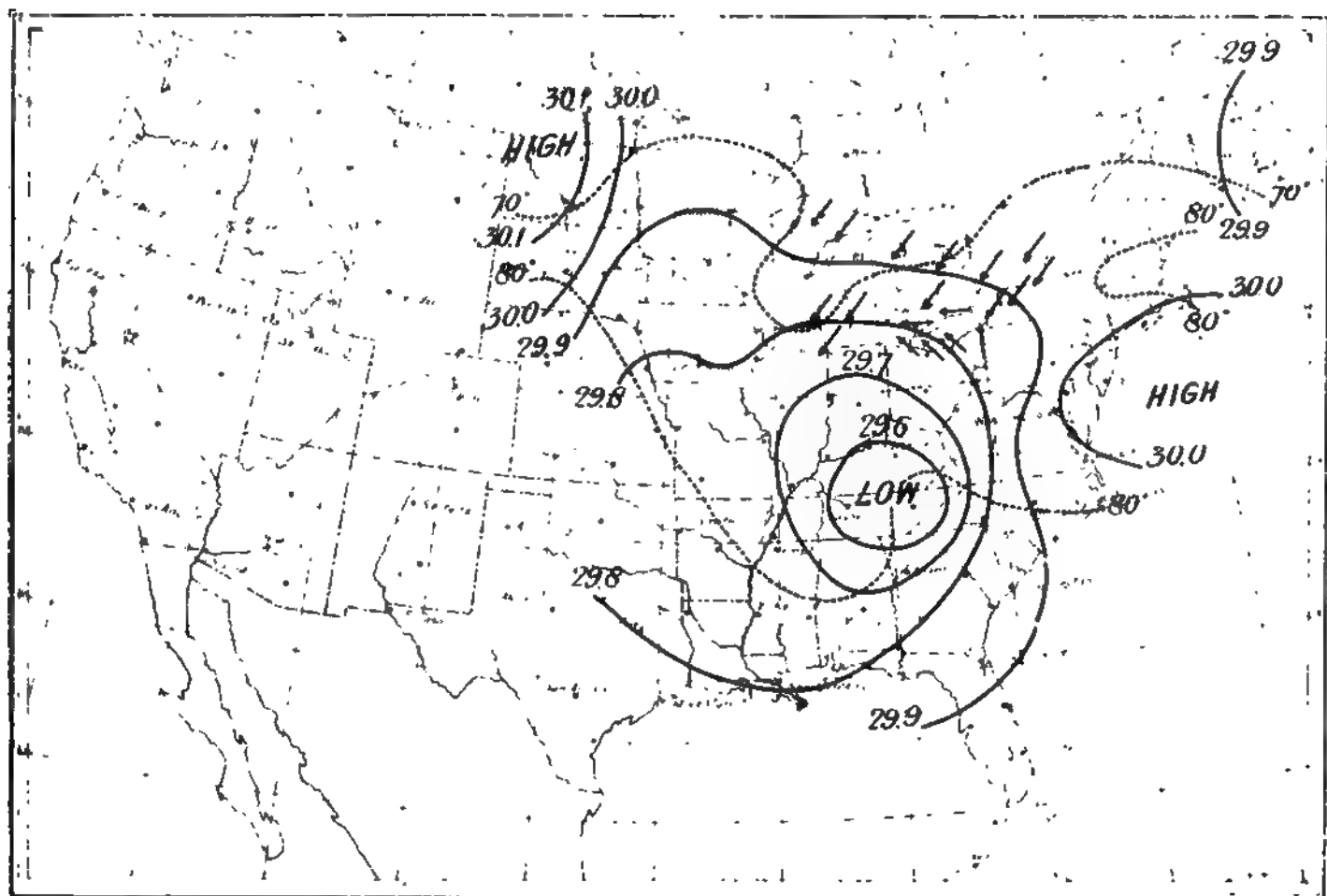
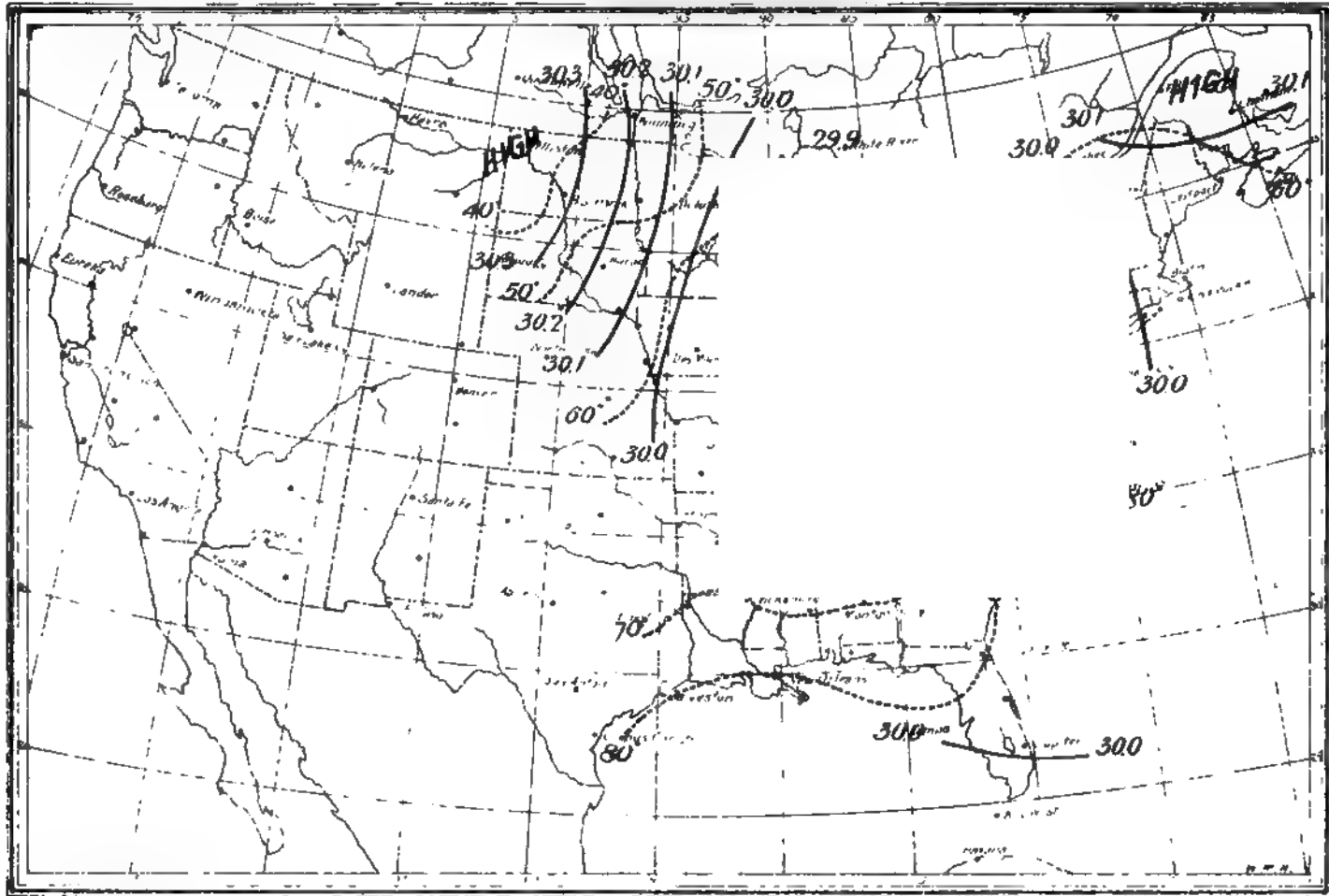


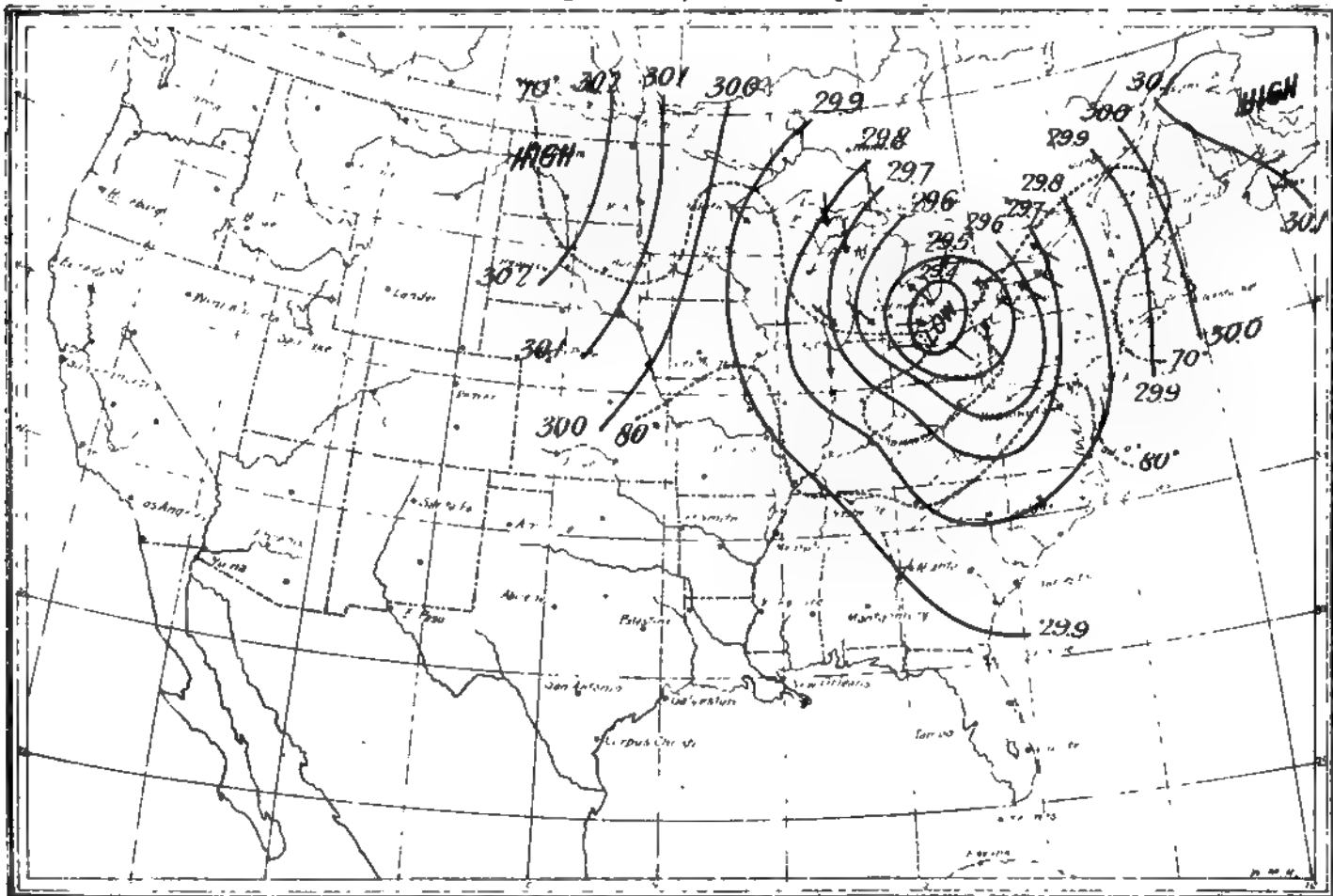
Chart 0000LIV.

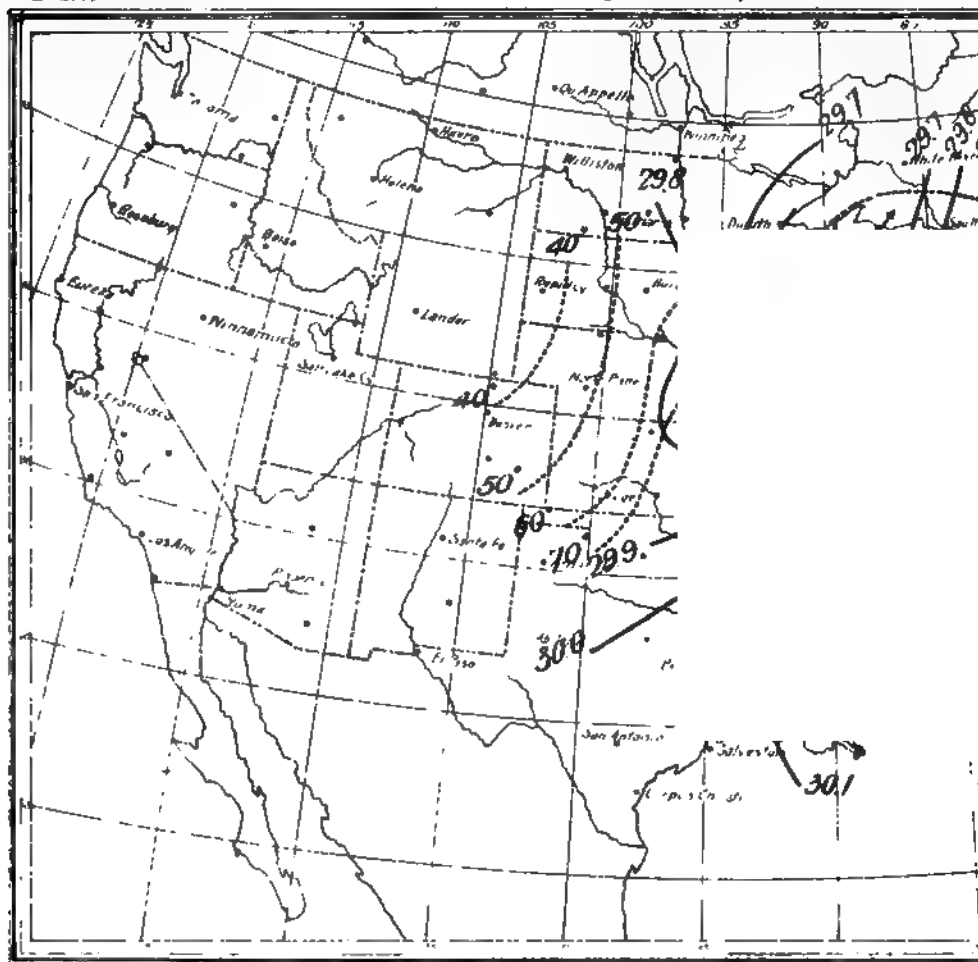
September 2, 1879—4:35 p. m.



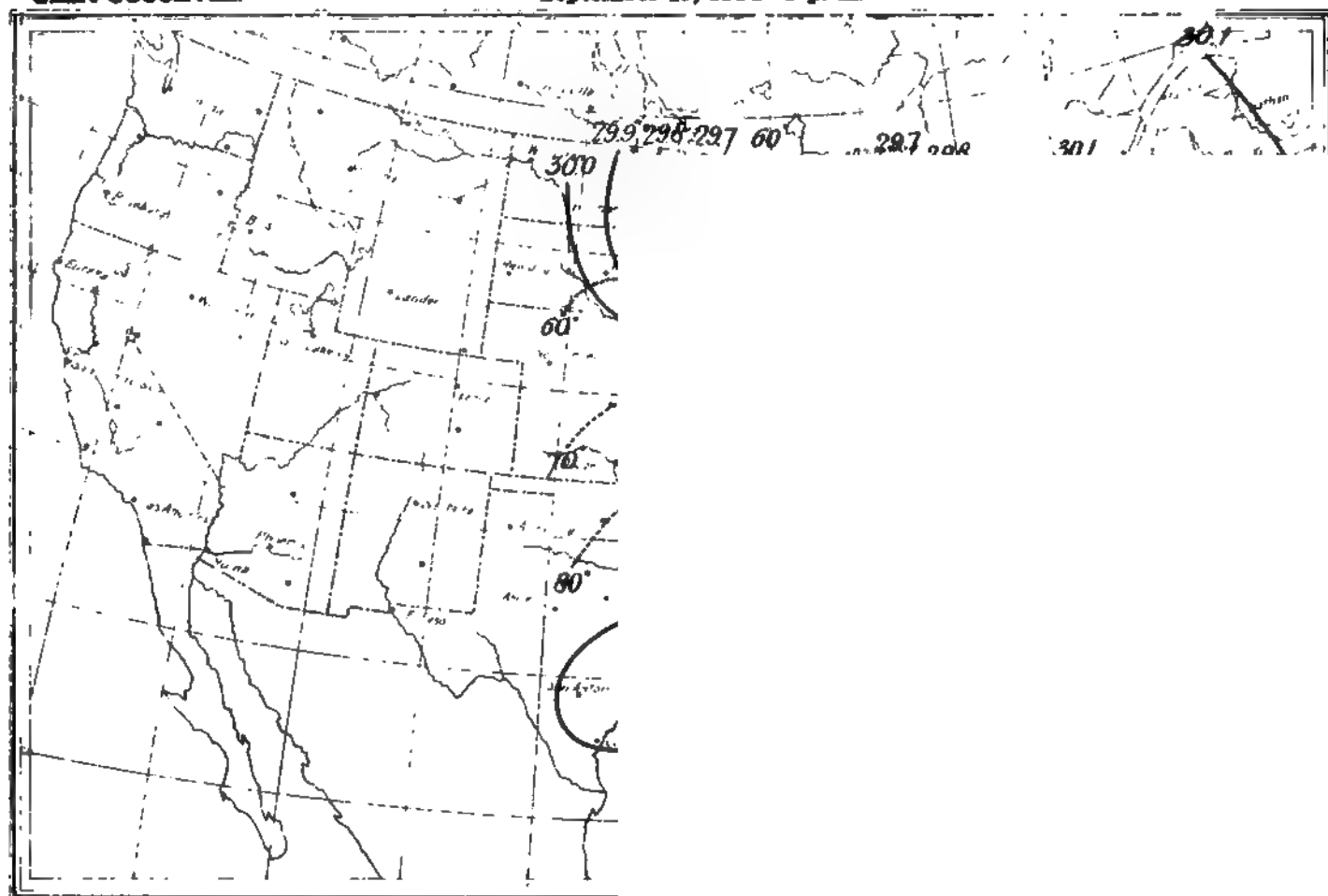


September 3, 1879—4:35 p. m.

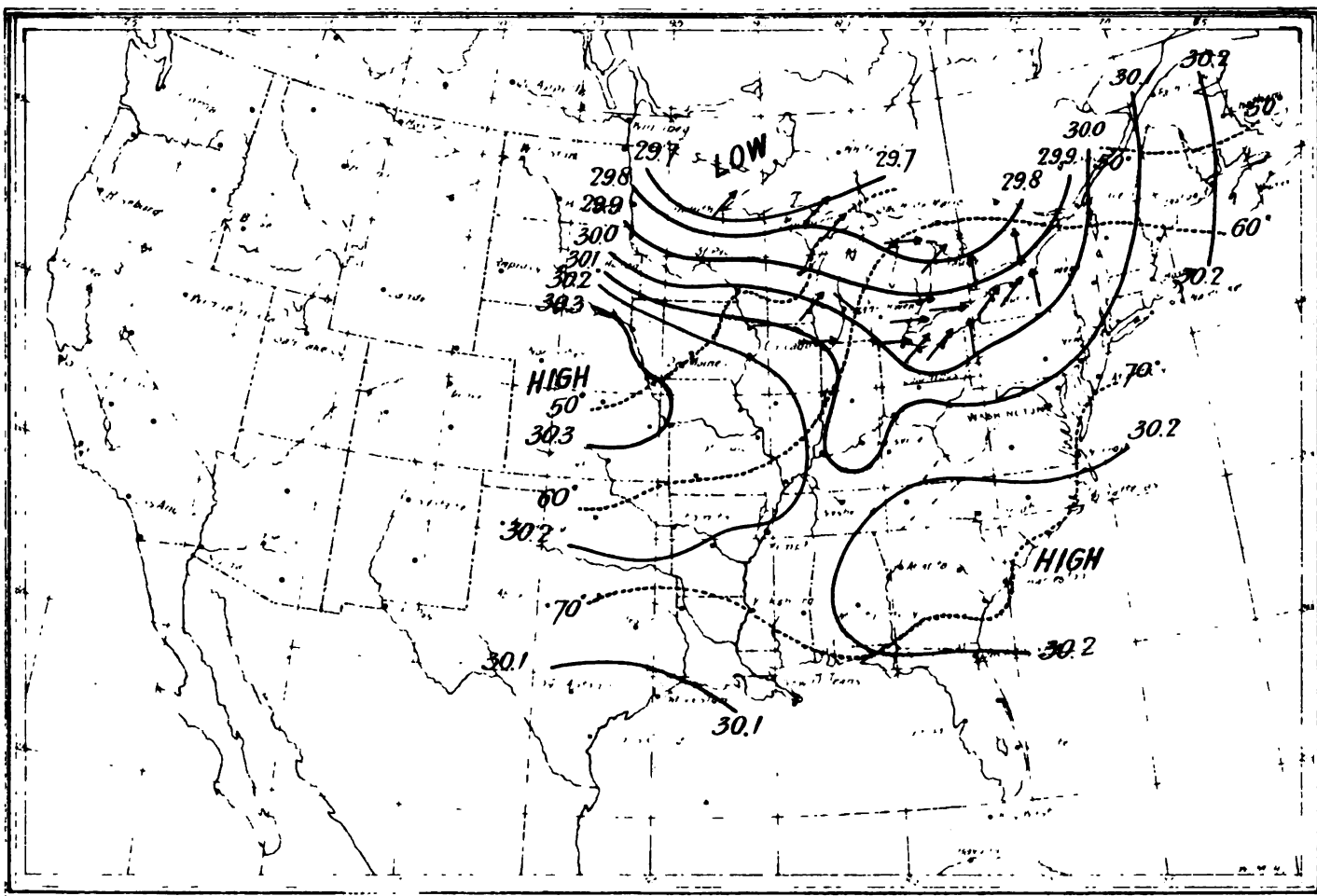




September 19, 1880-8 p. m.



September 20, 1880—7 a. m.



September 20, 1880—3 p. m.

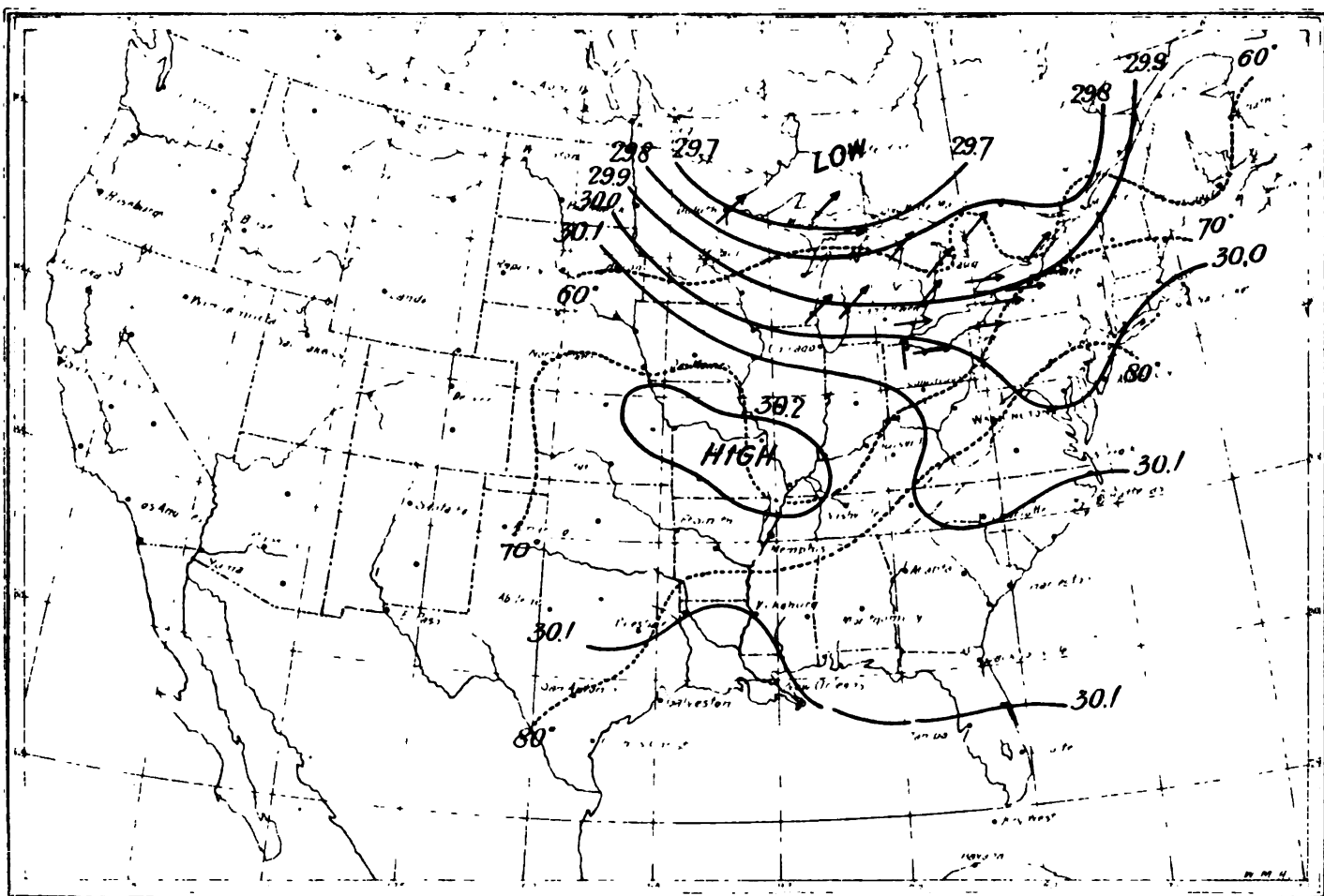


Chart 0000LXI.

September 27, 1880—7 a. m.

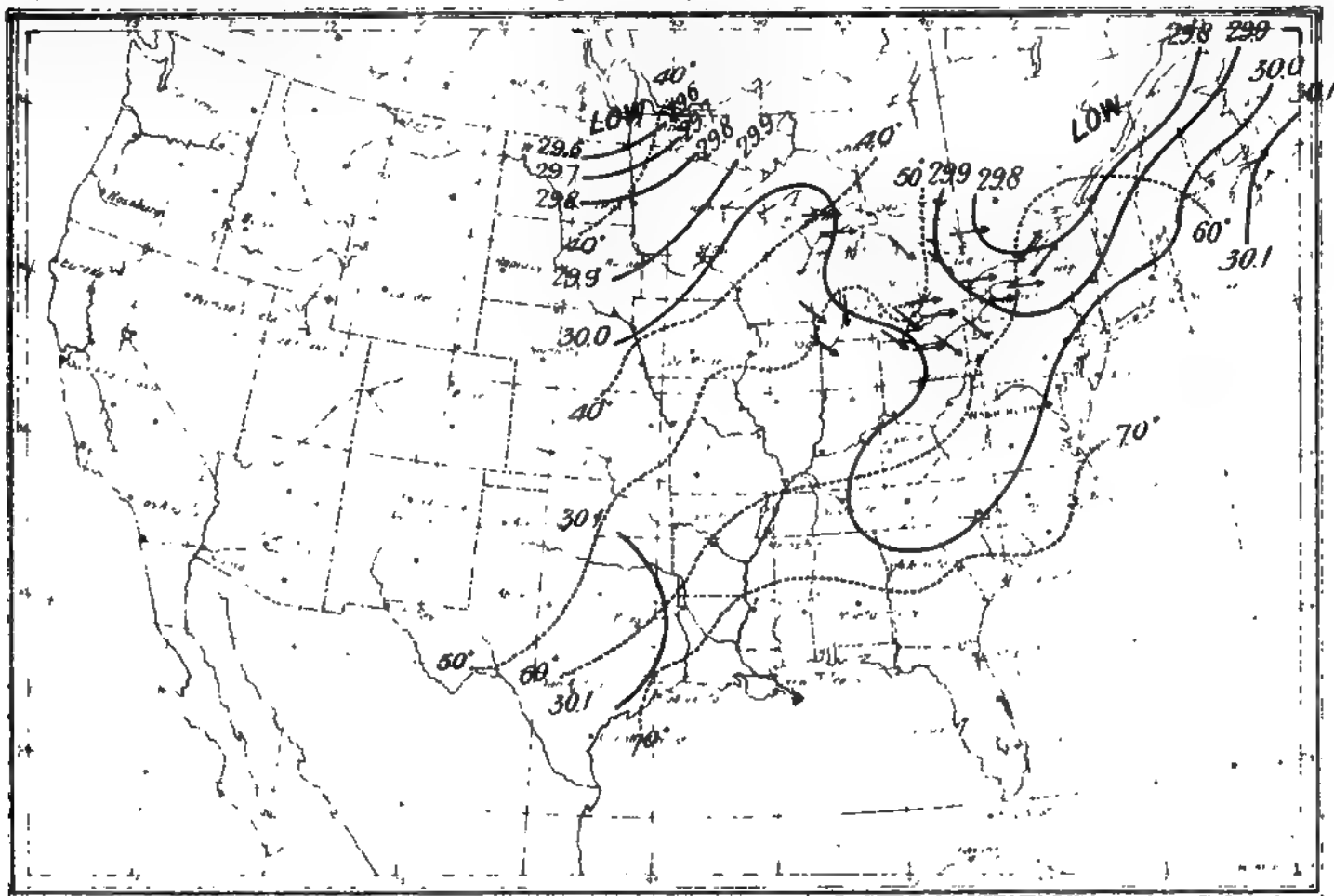
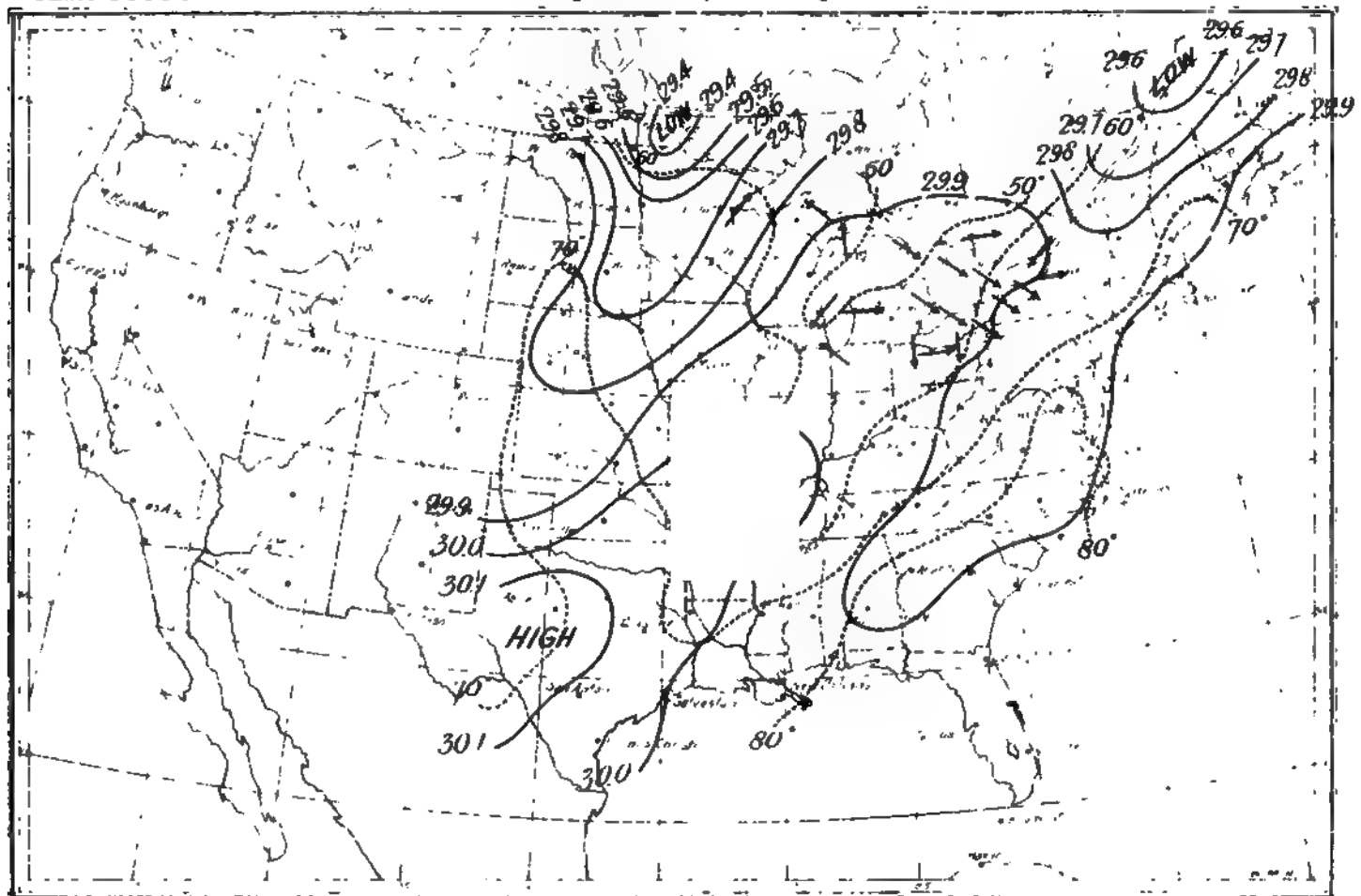
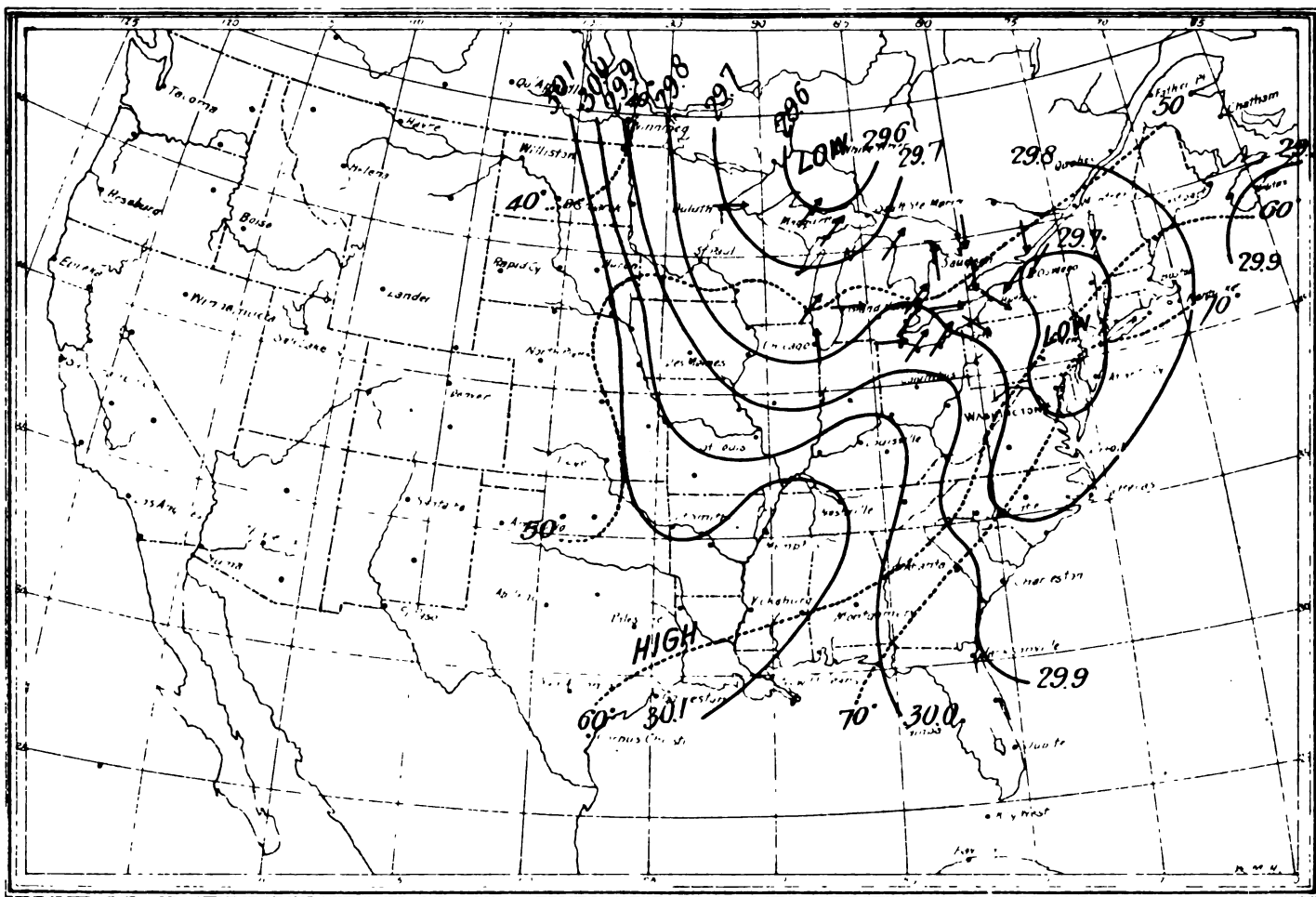


Chart 0000LXII.

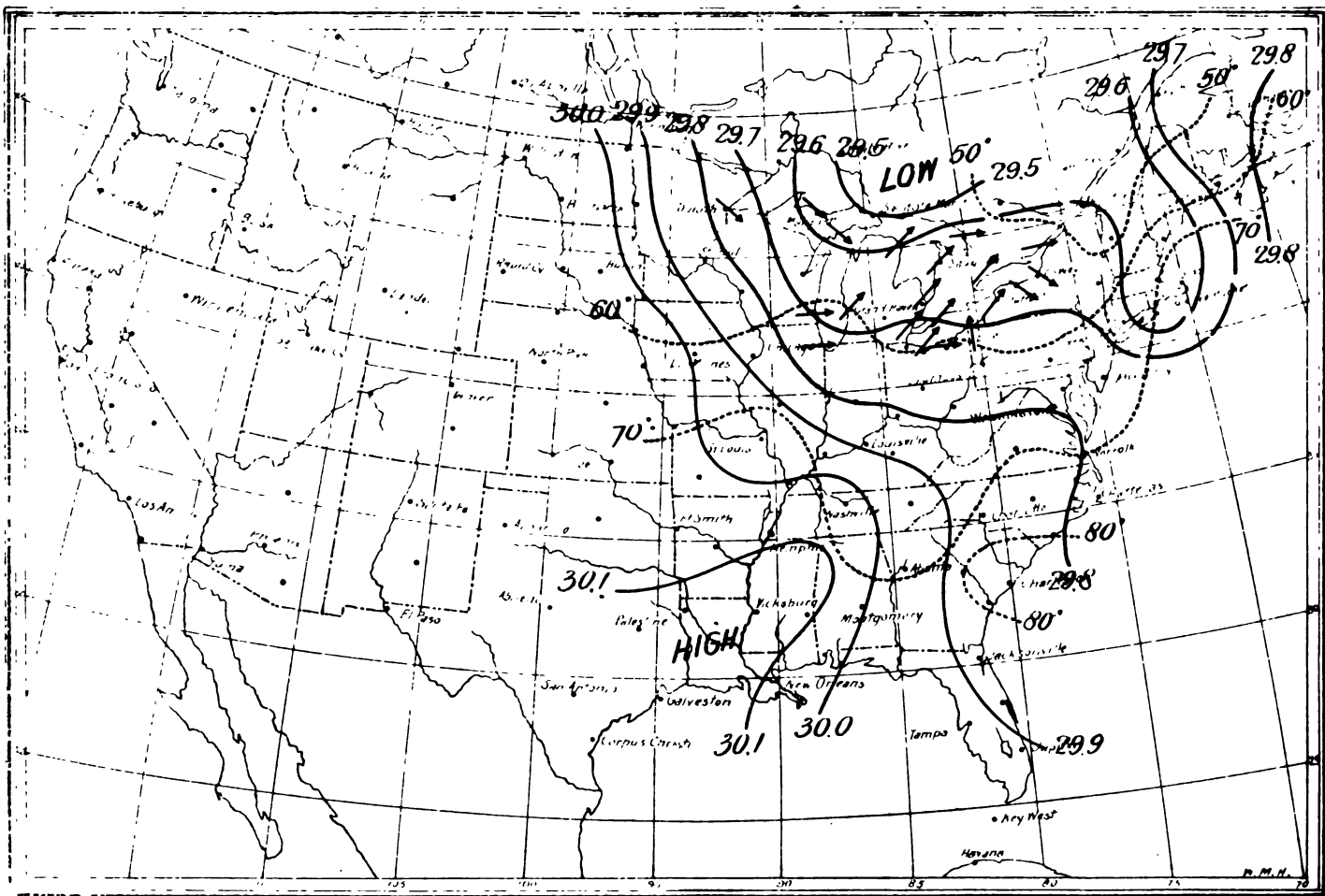
September 27, 1880—3 p. m.



September 28, 1880—7 a. m.



September 28, 1880—8 p. m.



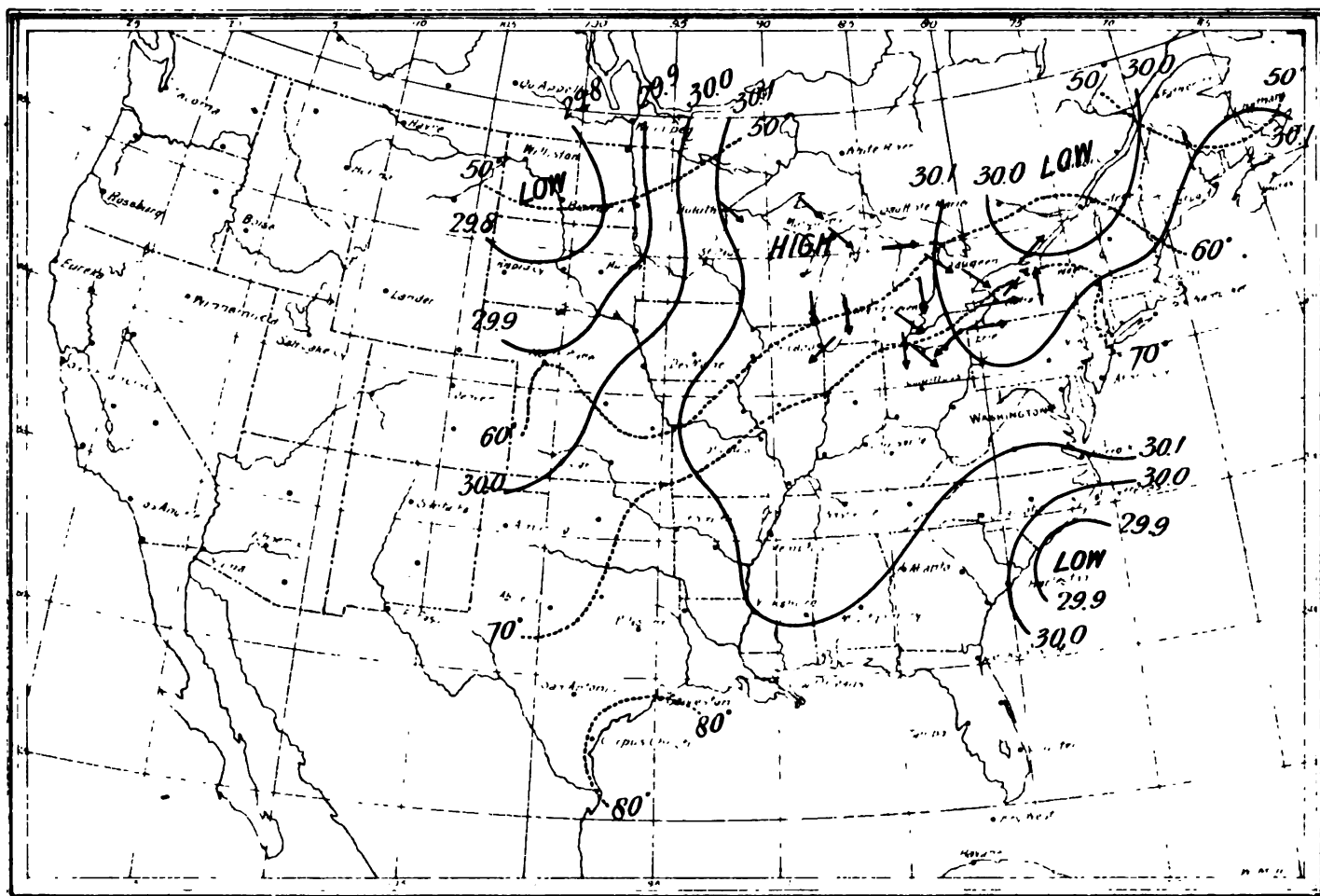
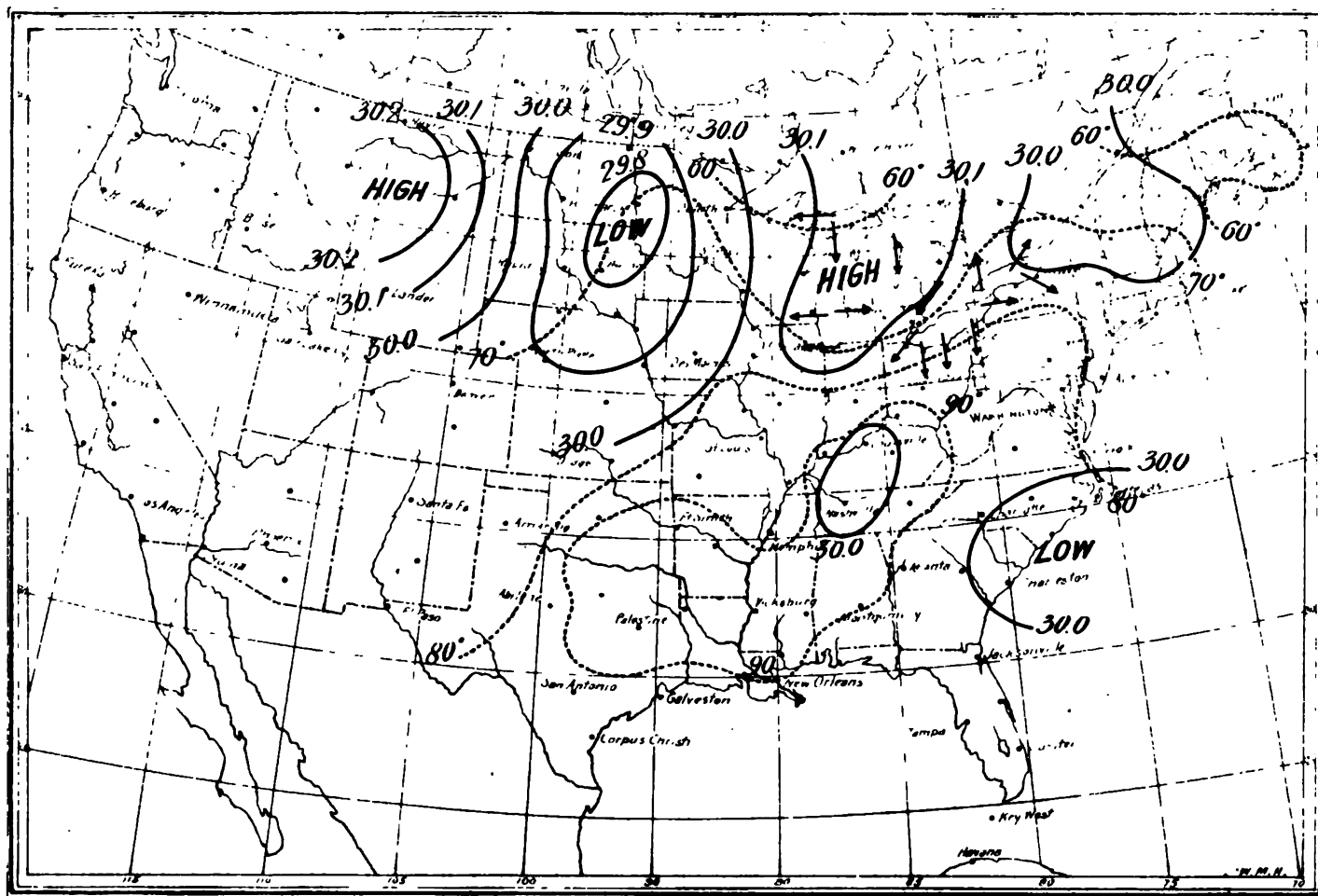


Chart CCCCXLVI.

September 9, 1881—3 p. m.



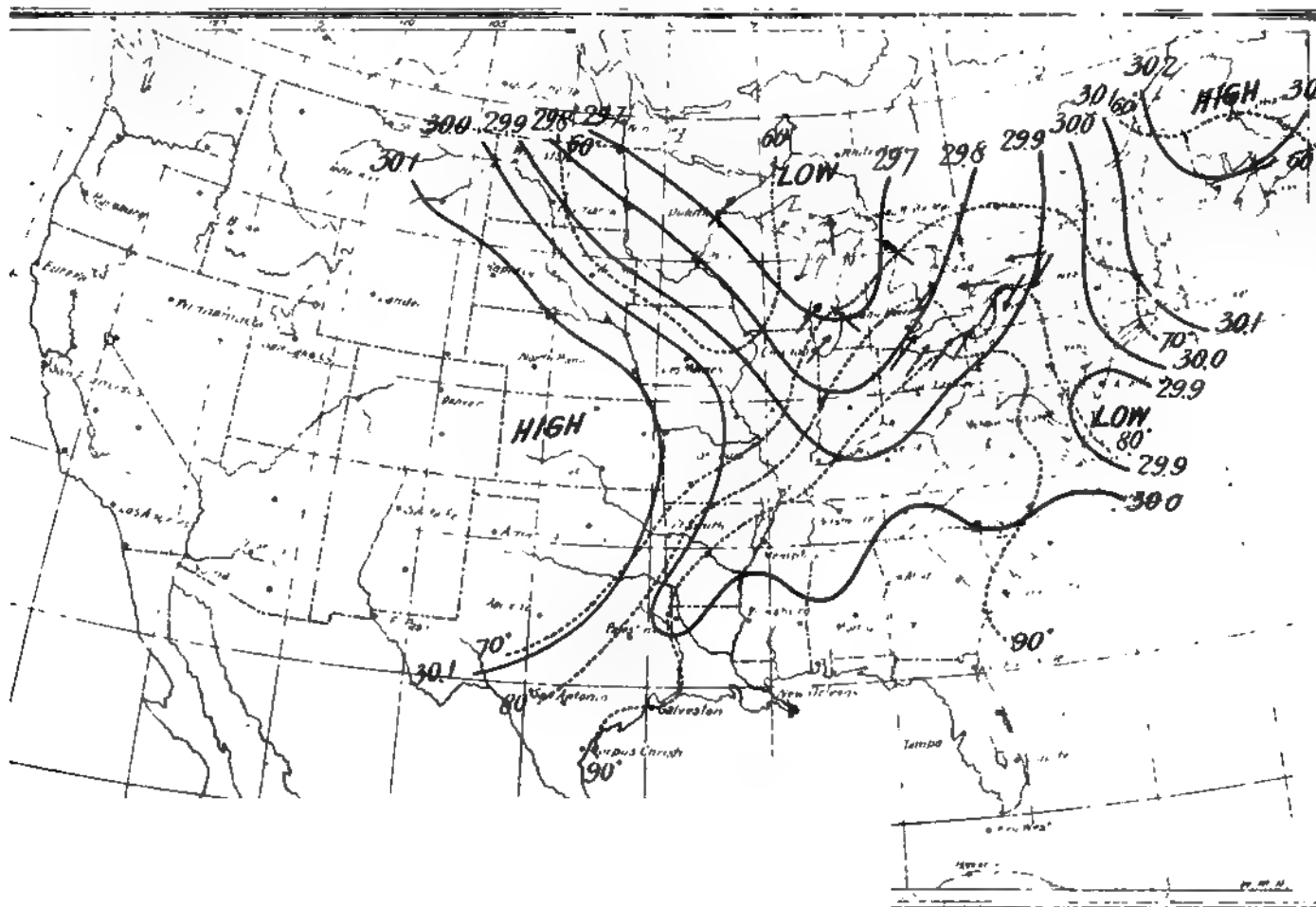
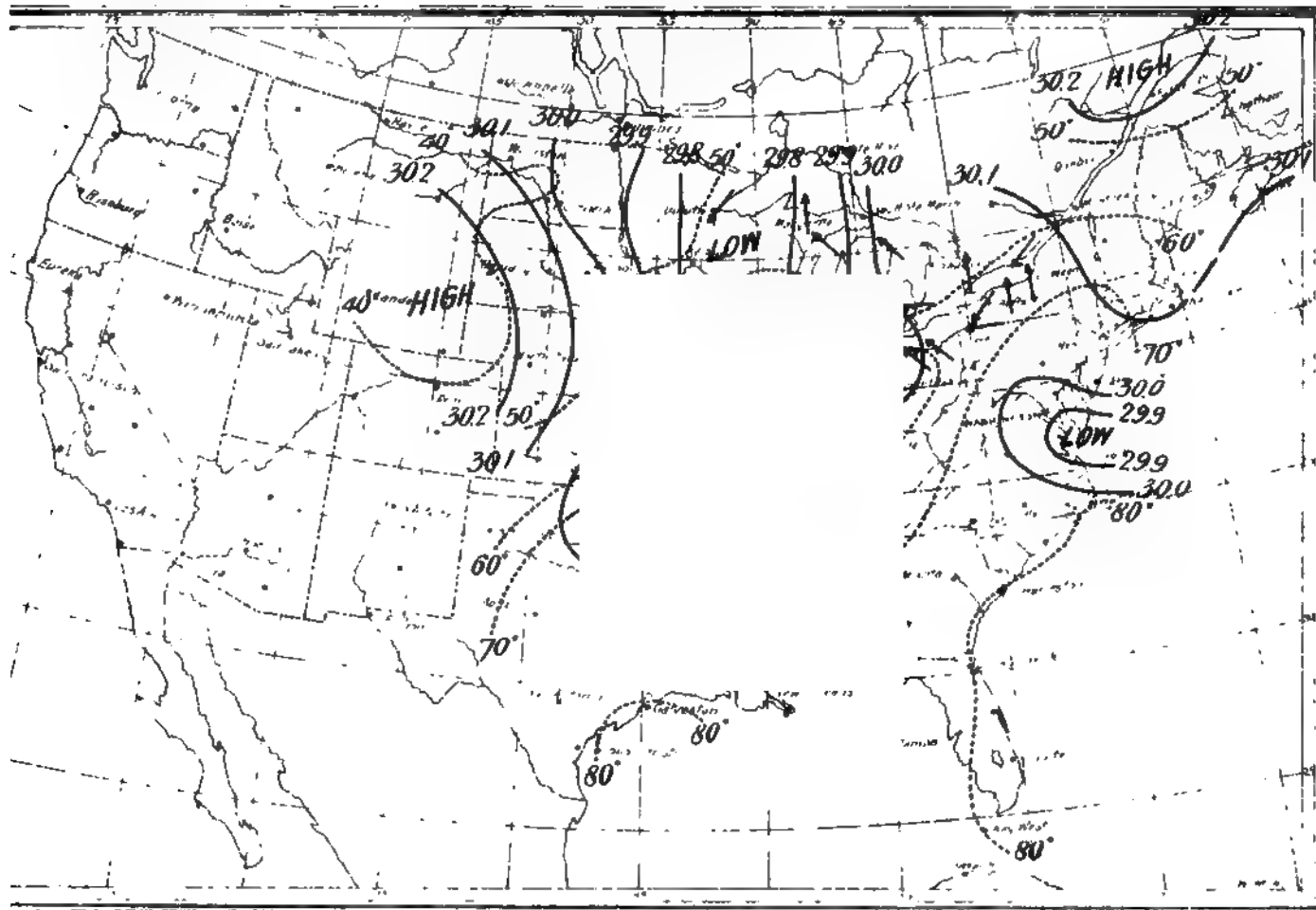


Chart 0000LXIX.

September 28, 1881—7 a. m.

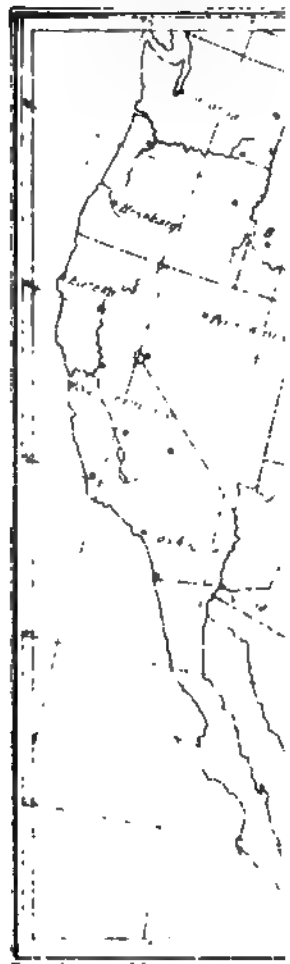
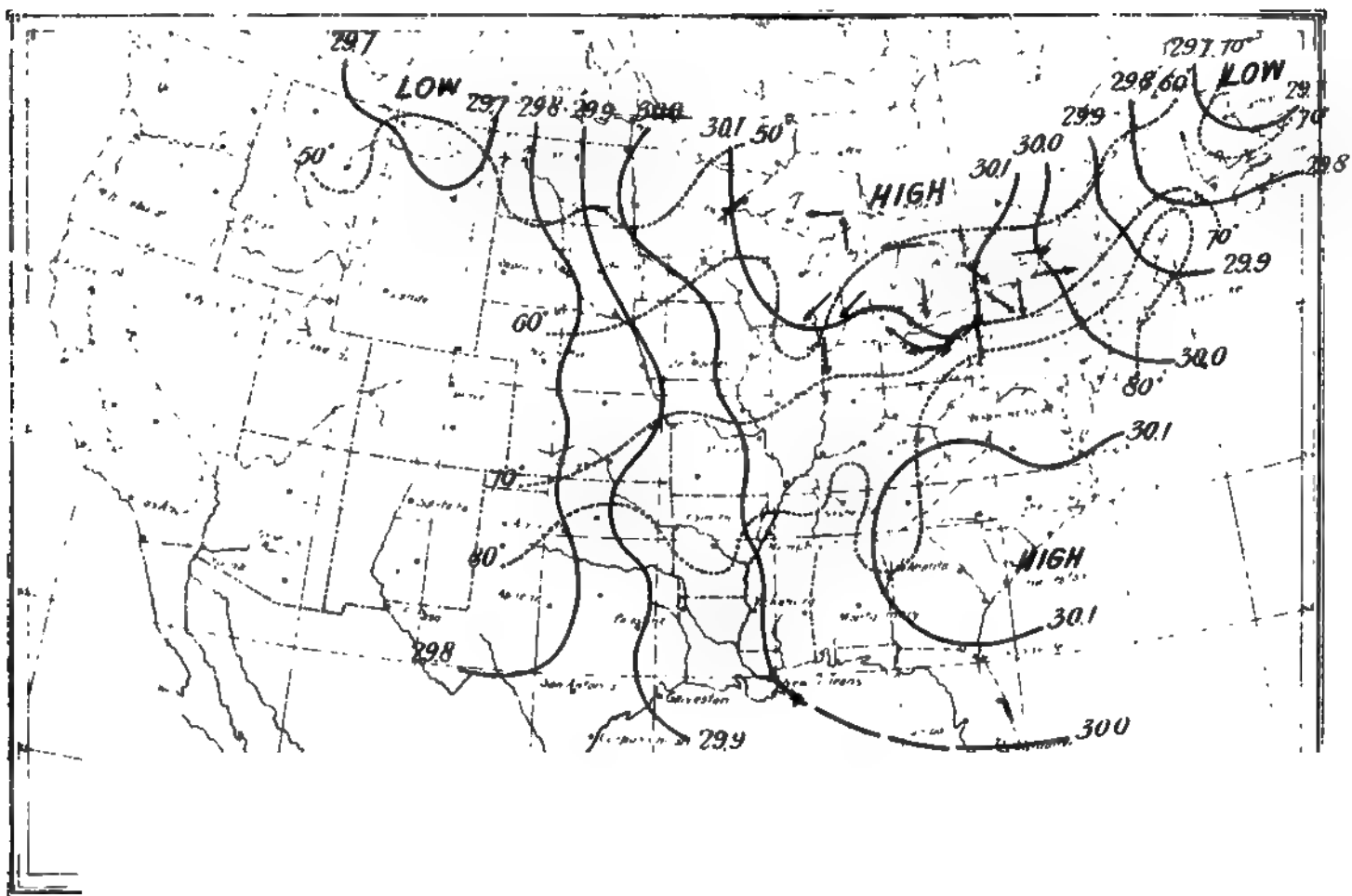


Chart 0000LXX.

September 28, 1881—3 p. m.



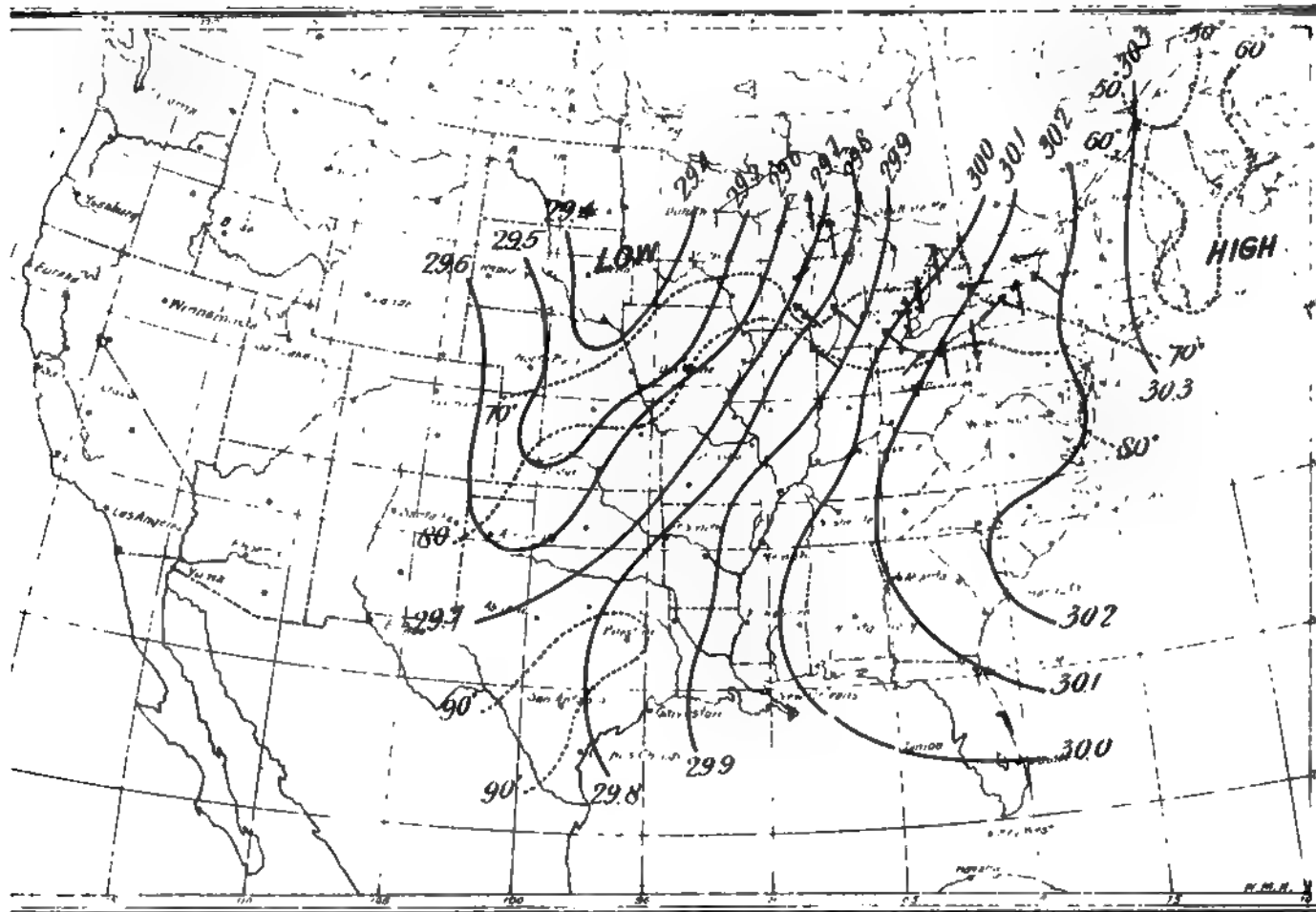
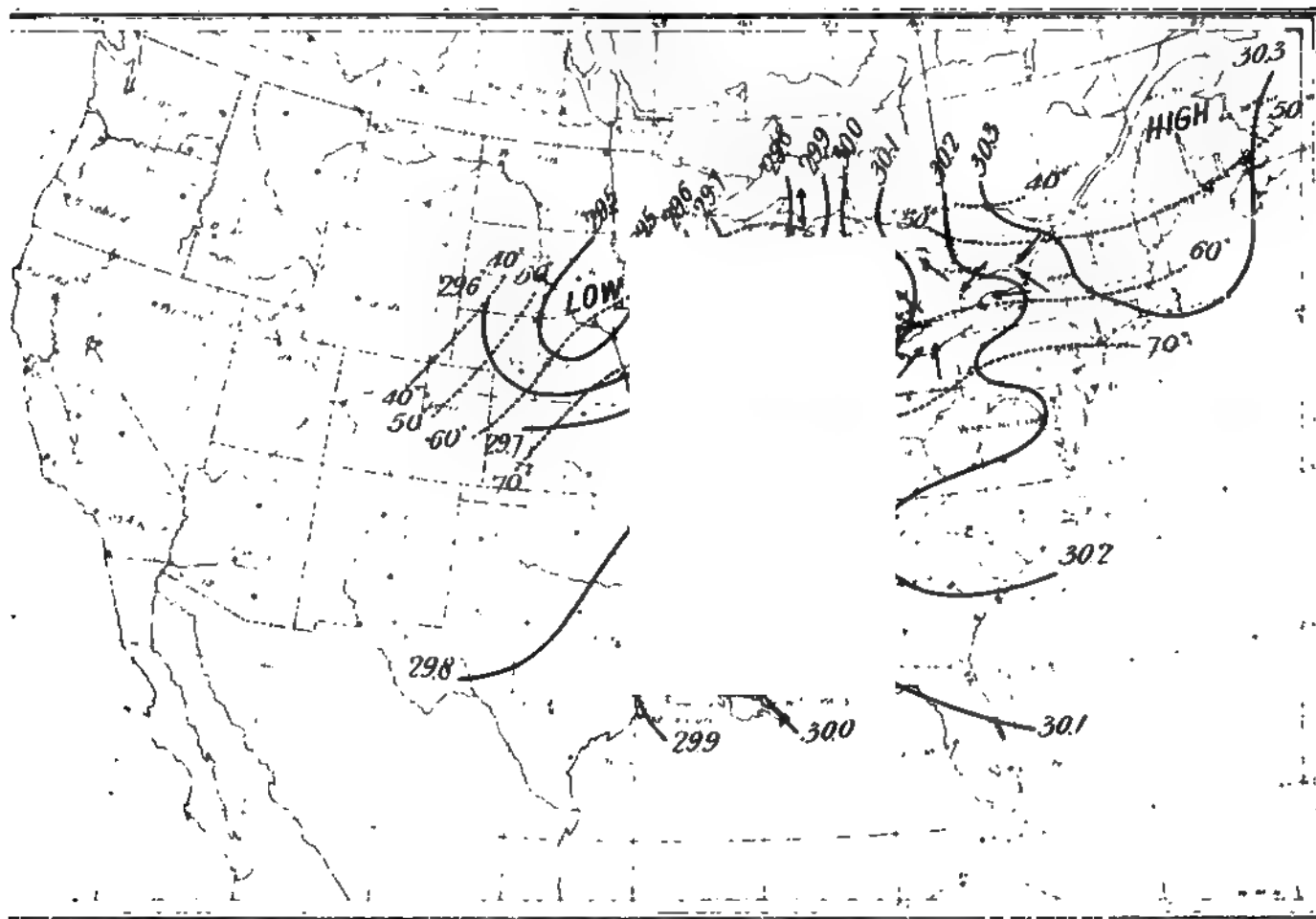


Chart 0000LXXIII.

September 13, 1882—7 a. m.

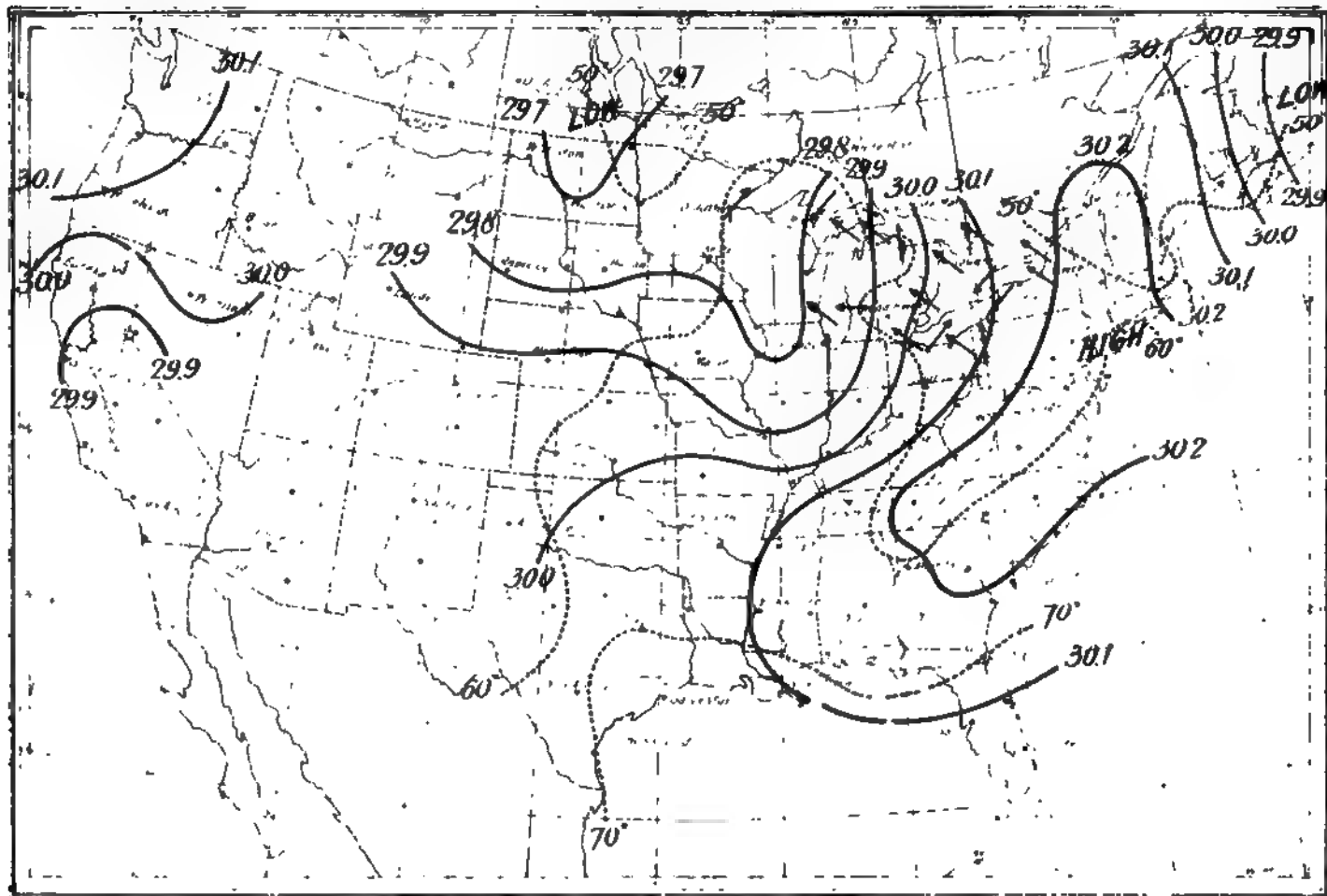
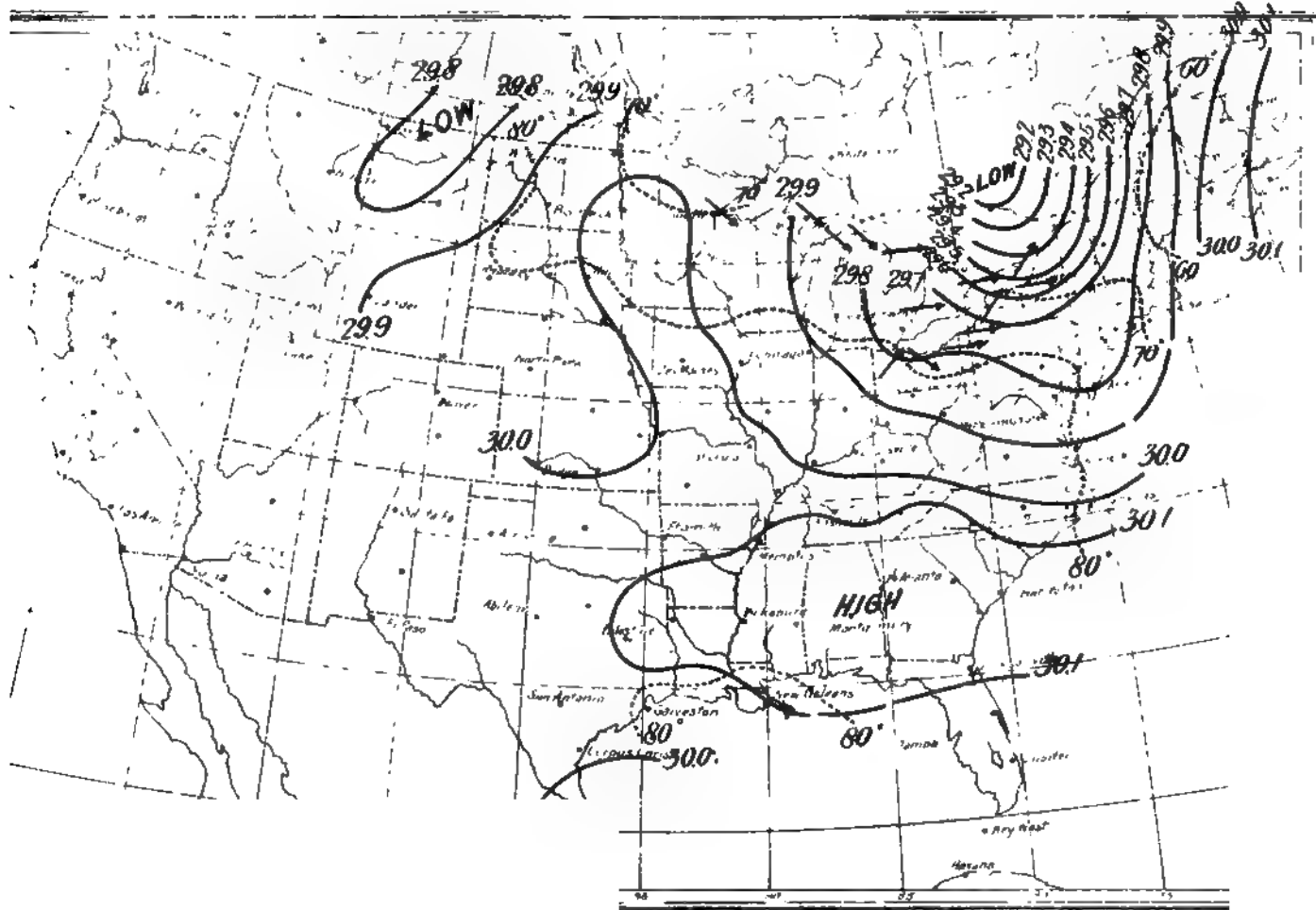
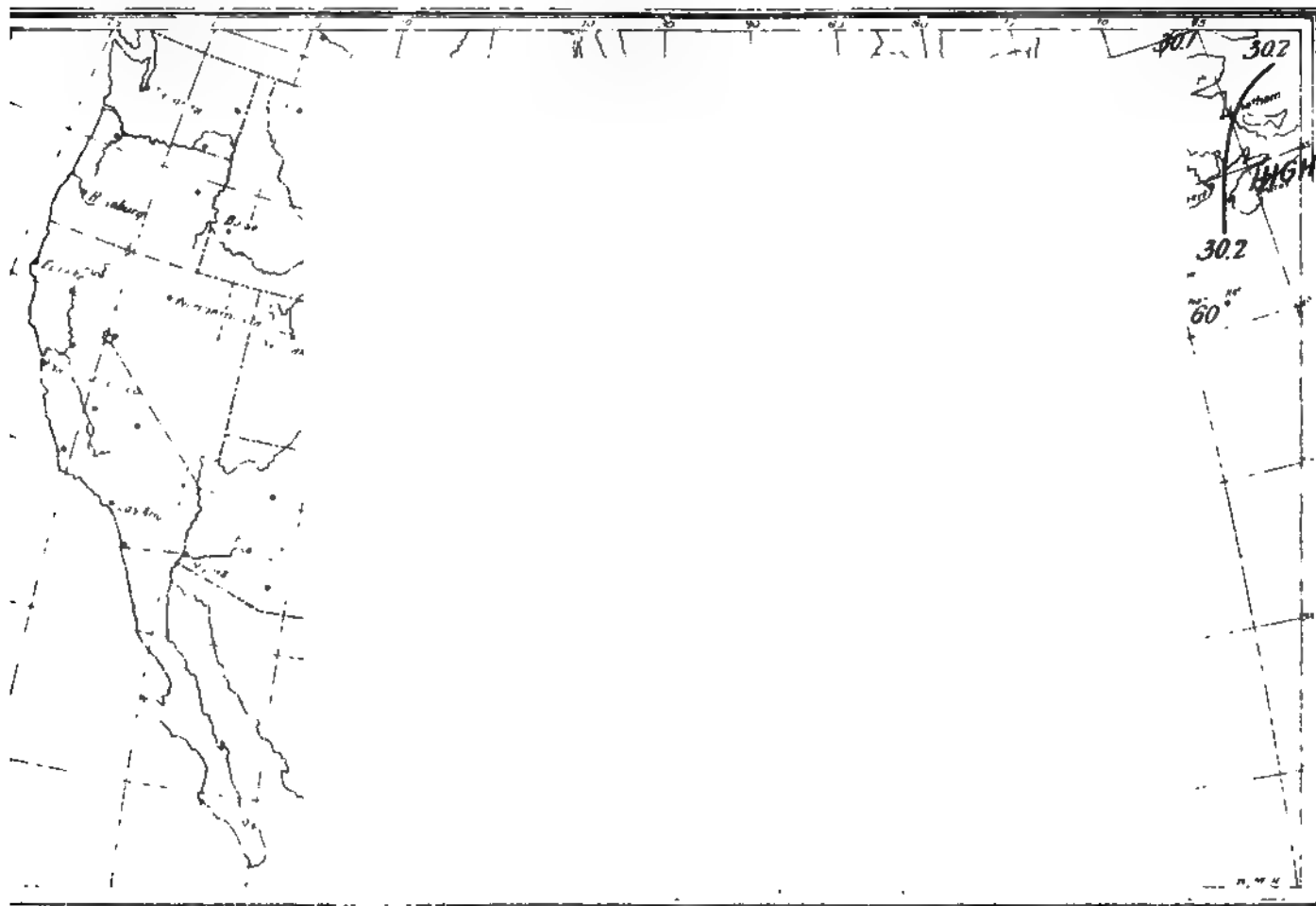


Chart 0000LXXIV.

September 13, 1882—3 p. m.



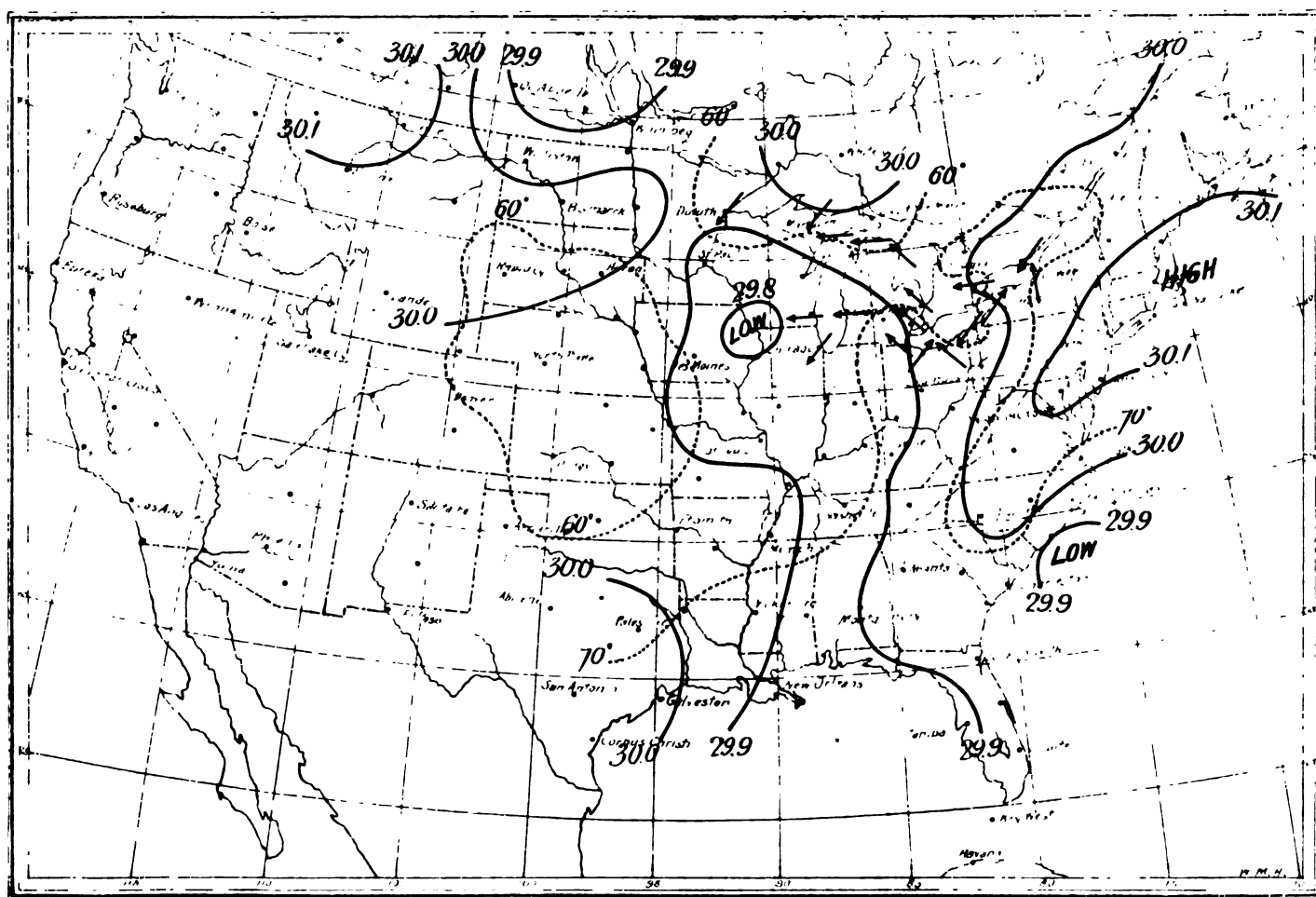
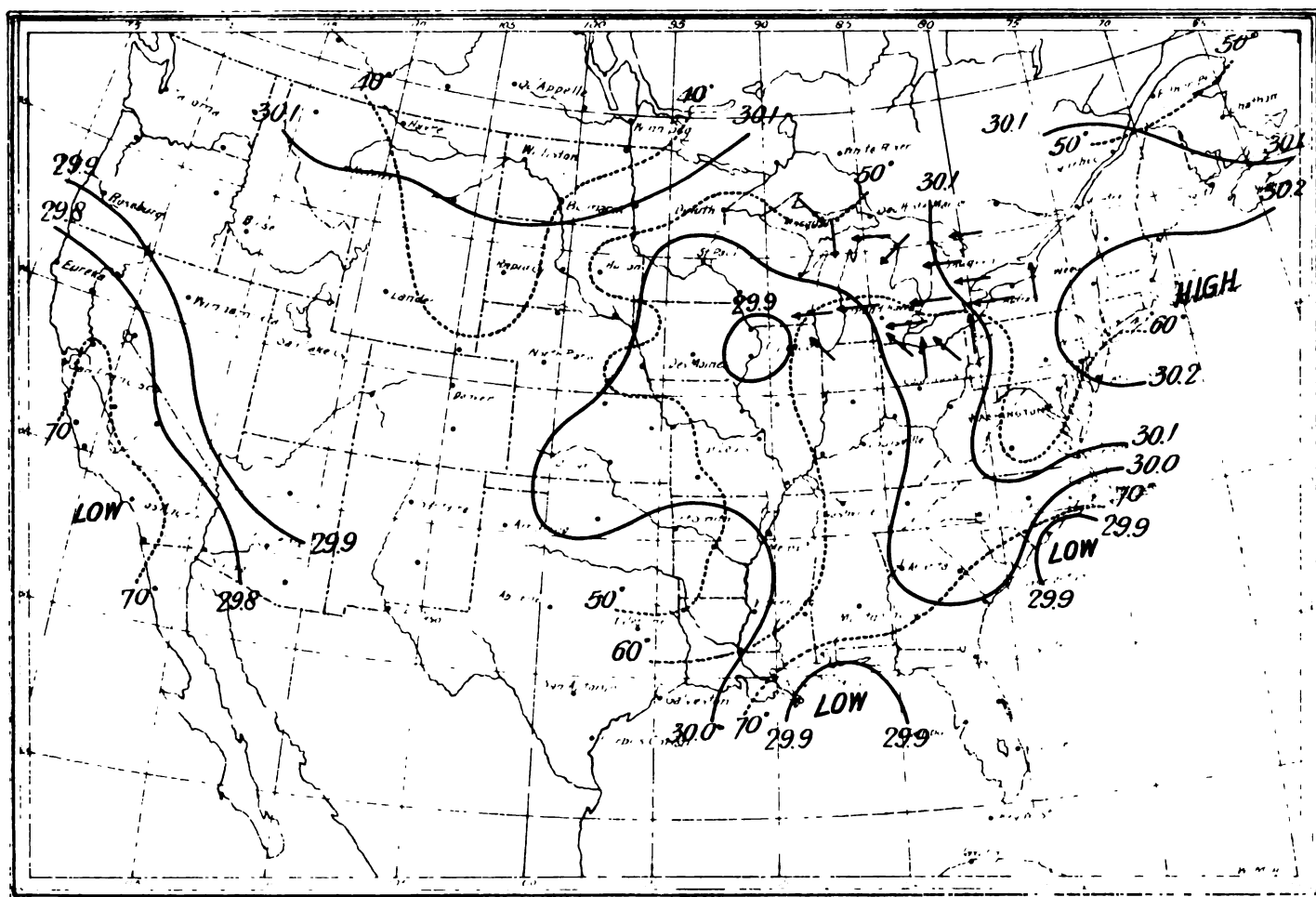


Chart CCCCXXXIX.

September 24, 1883—7 a. m.

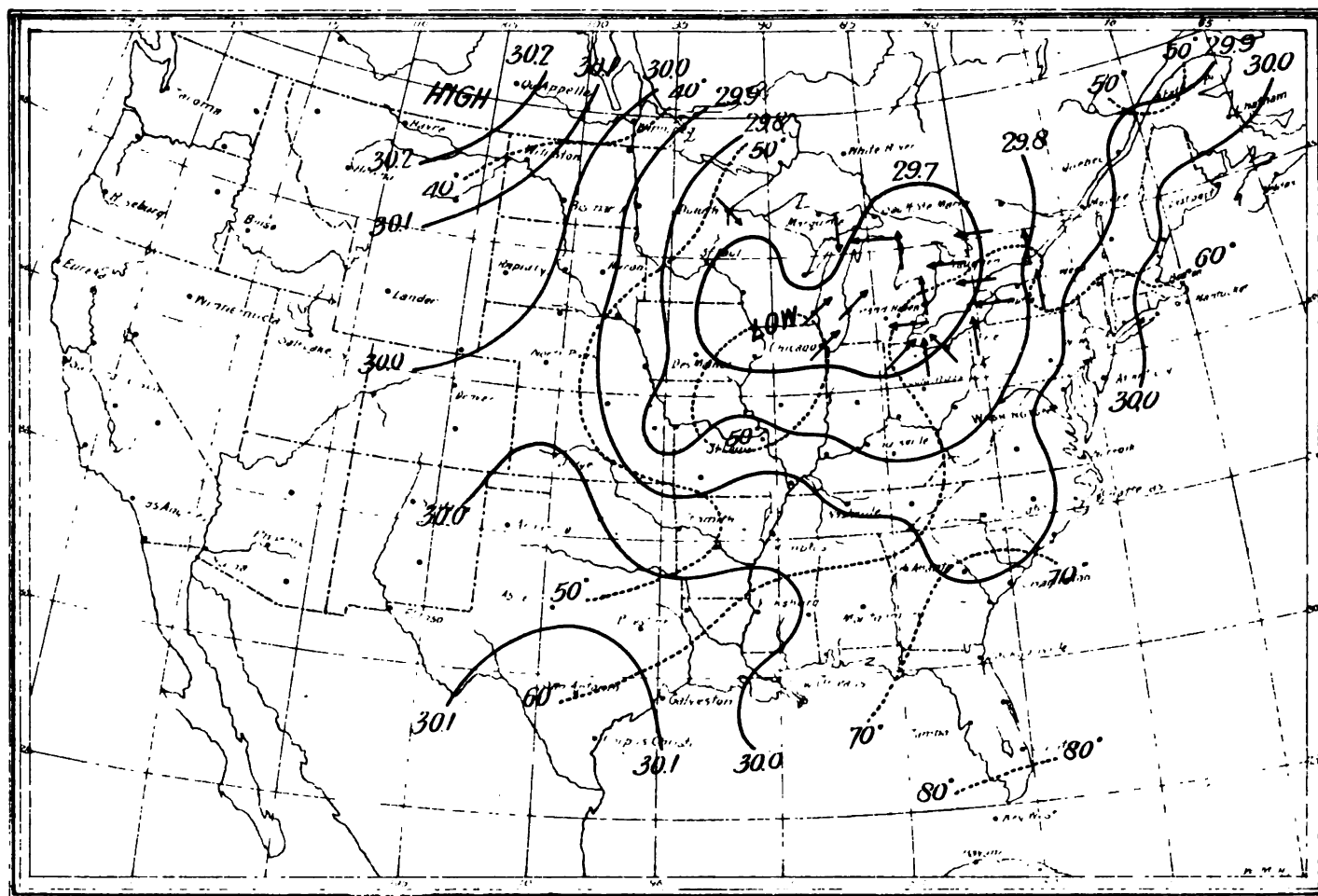


Chart CCCCXXX.

September 24, 1883—3 p. m.

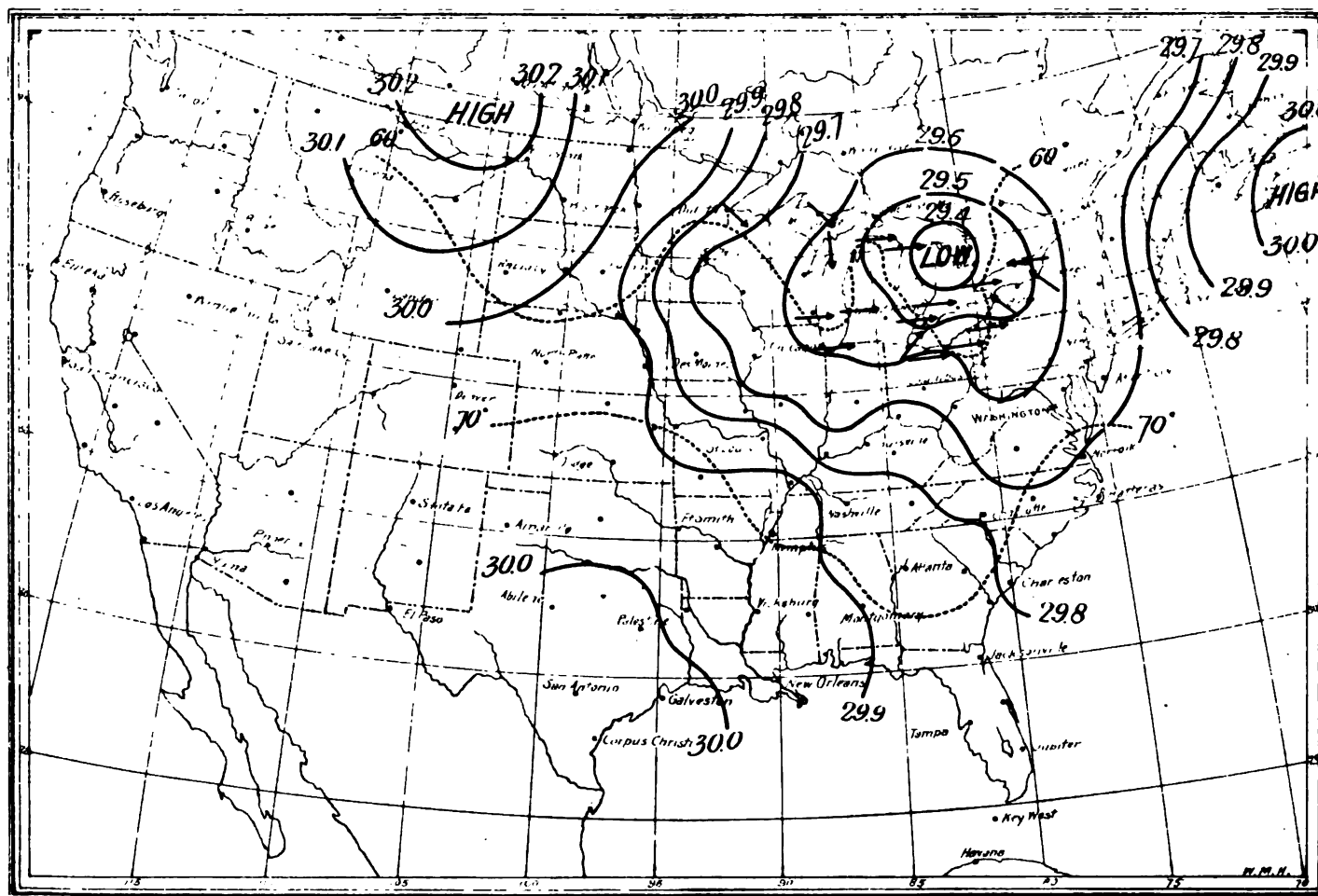


Chart 0000LXXXI

September 23, 1884—7 a. m.

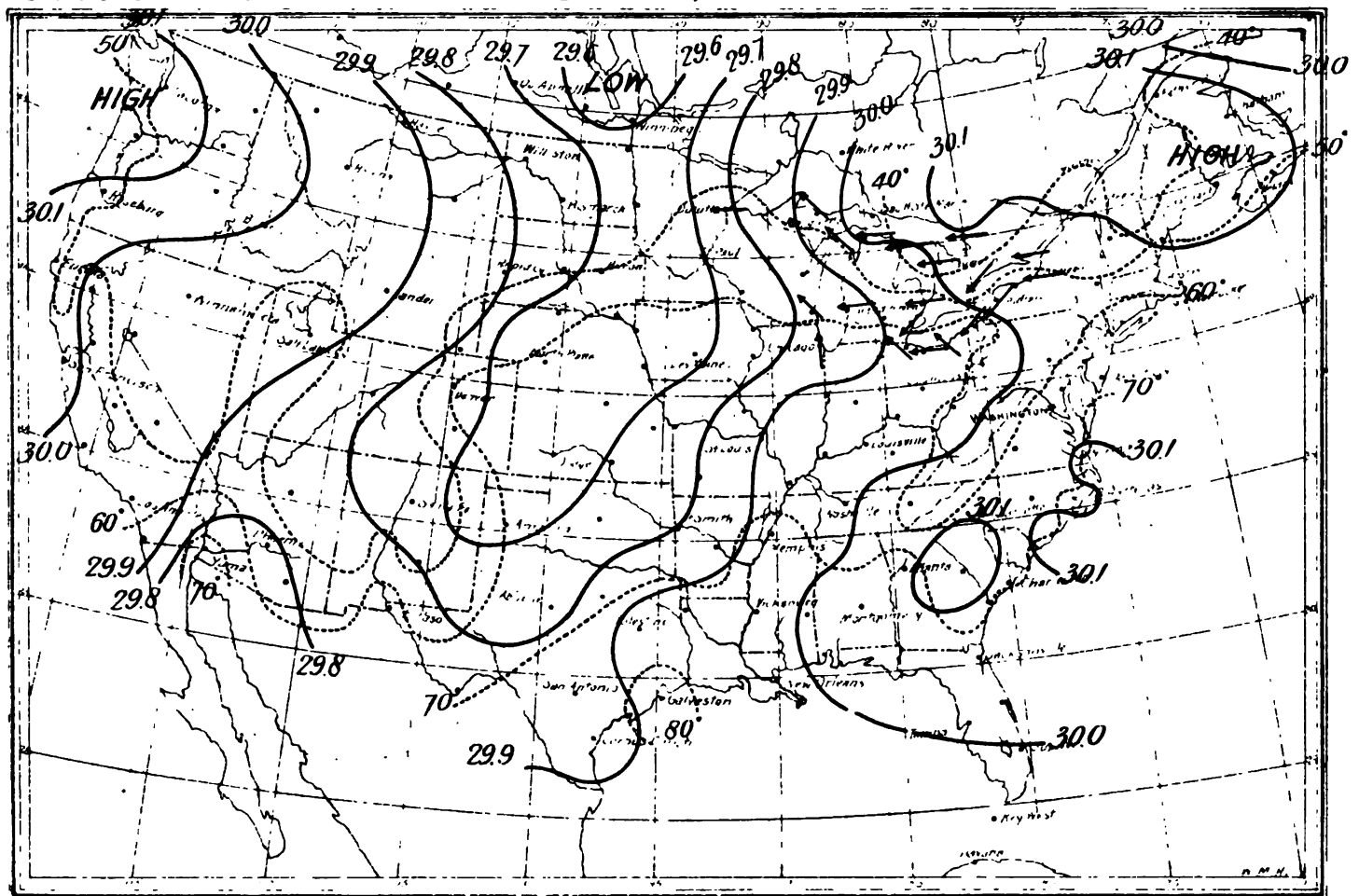
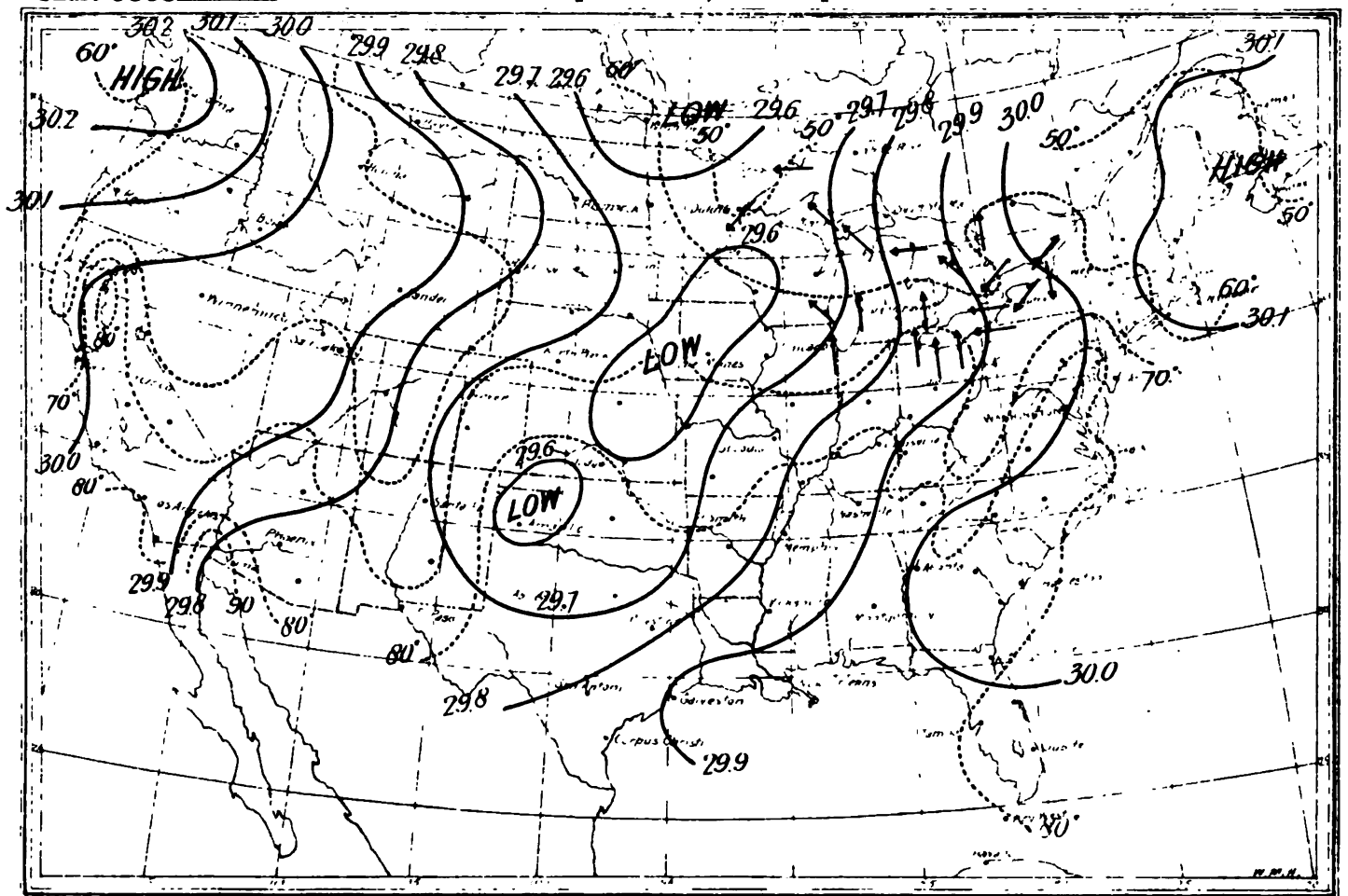
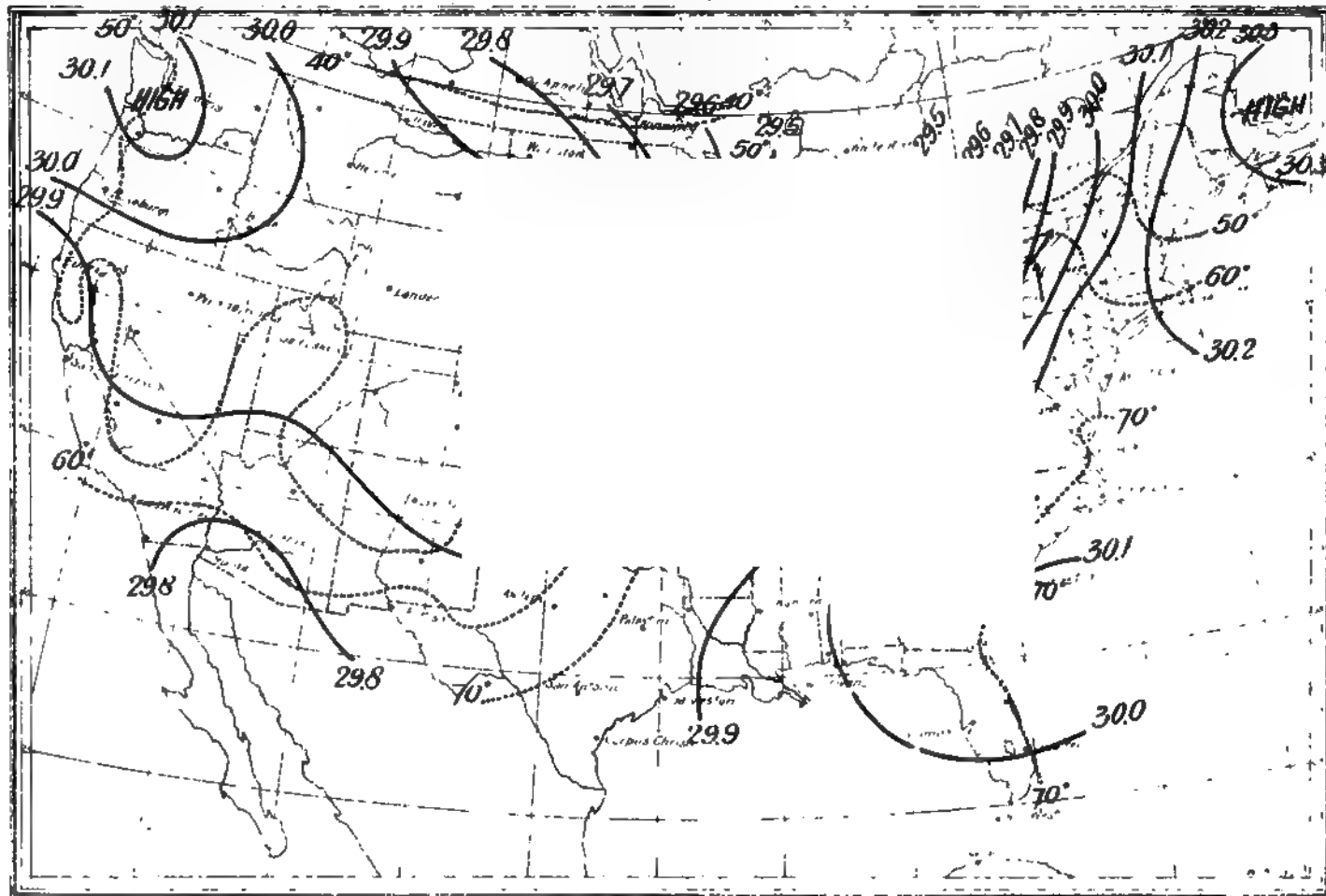


Chart 0000LXXXII

September 23, 1884—3 p. m.





September 24, 1884—8 p. m.

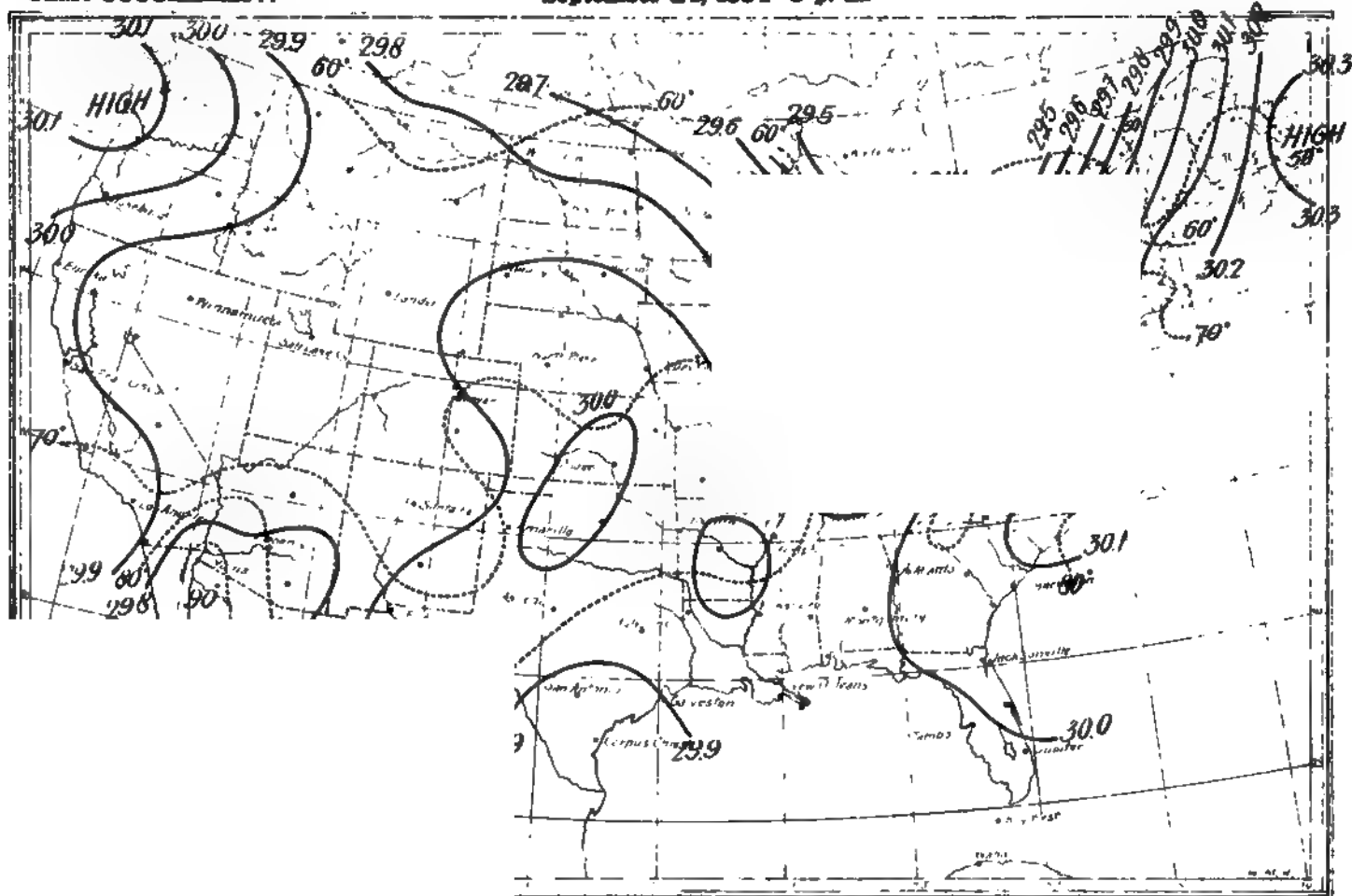


Chart 0000LXXXV.

September 7, 1885—7 a. m.

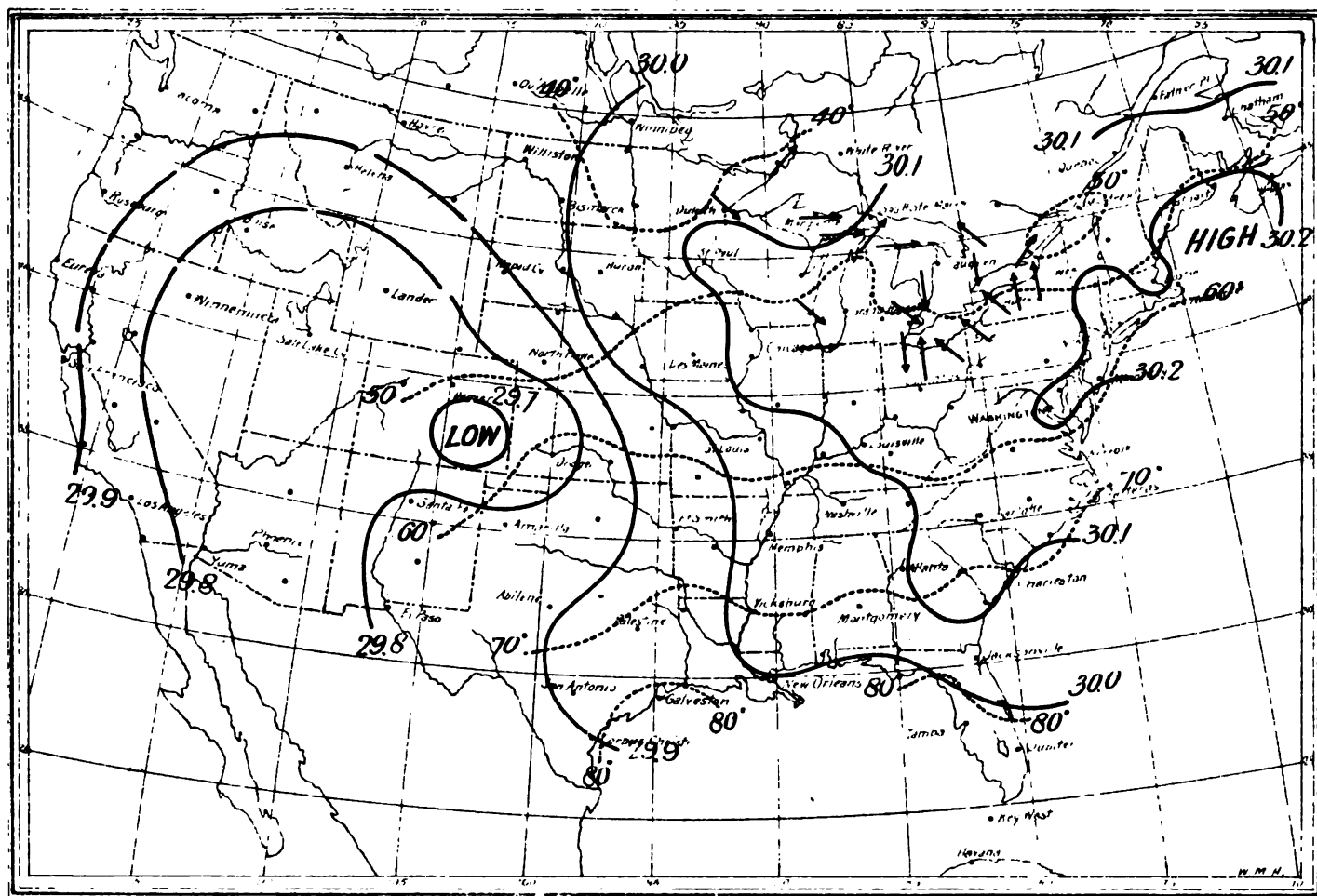


Chart 0000LXXXVI.

September 7, 1885—8 p. m.

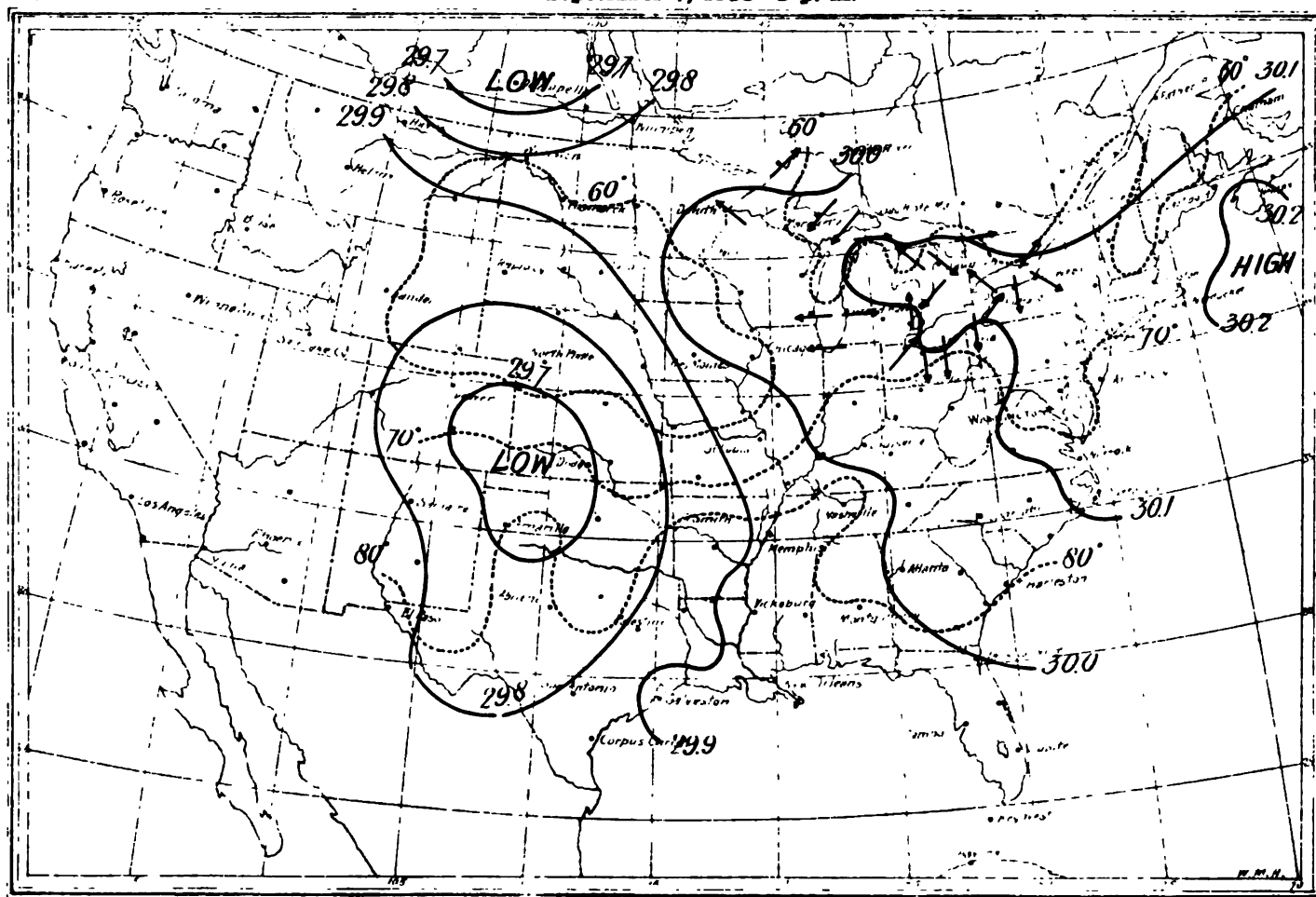


Chart 0000LXXXIII.

September 24, 1884—7 a. m.

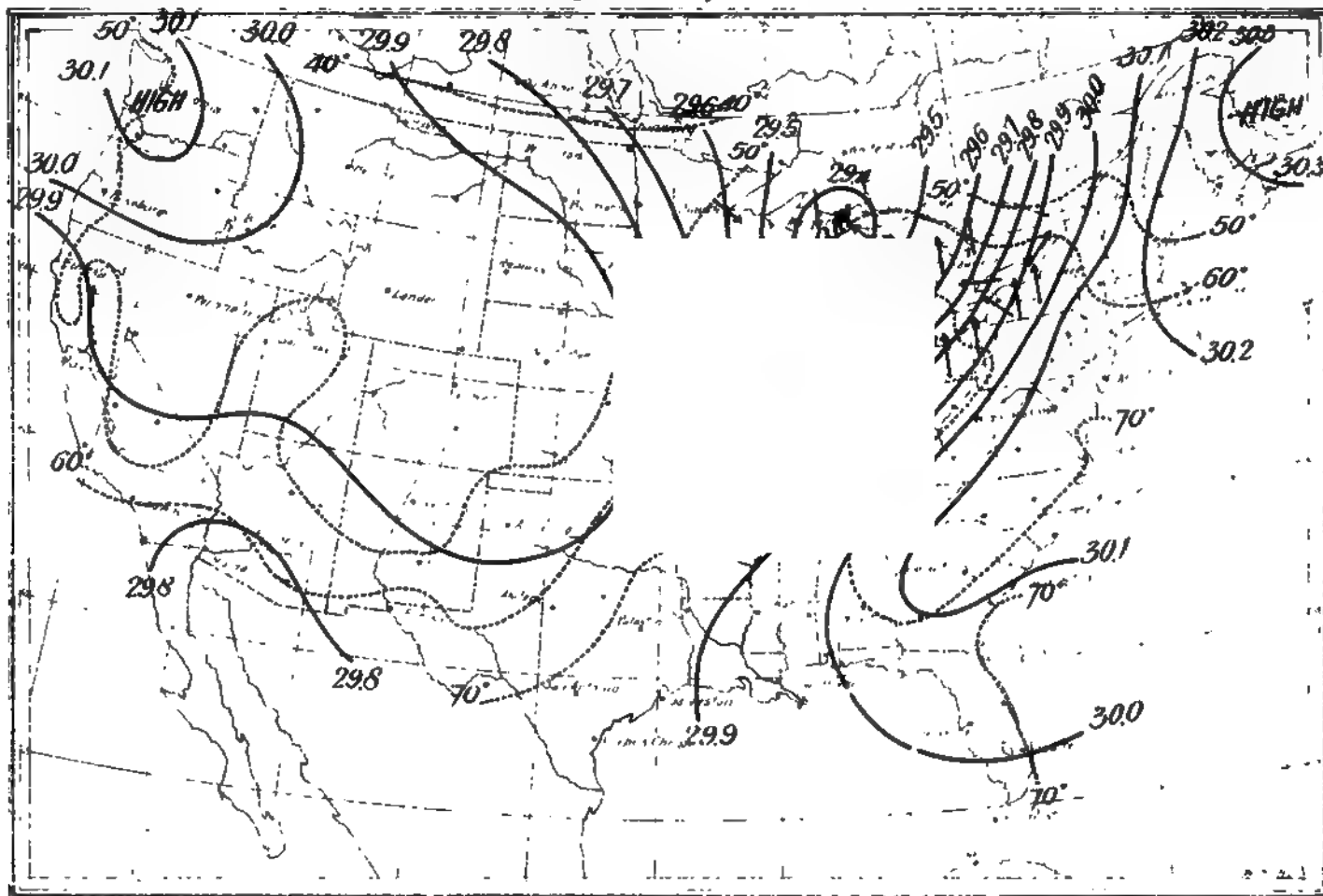


Chart 0000LXXXIV.

September 24, 1884—8 p. m.

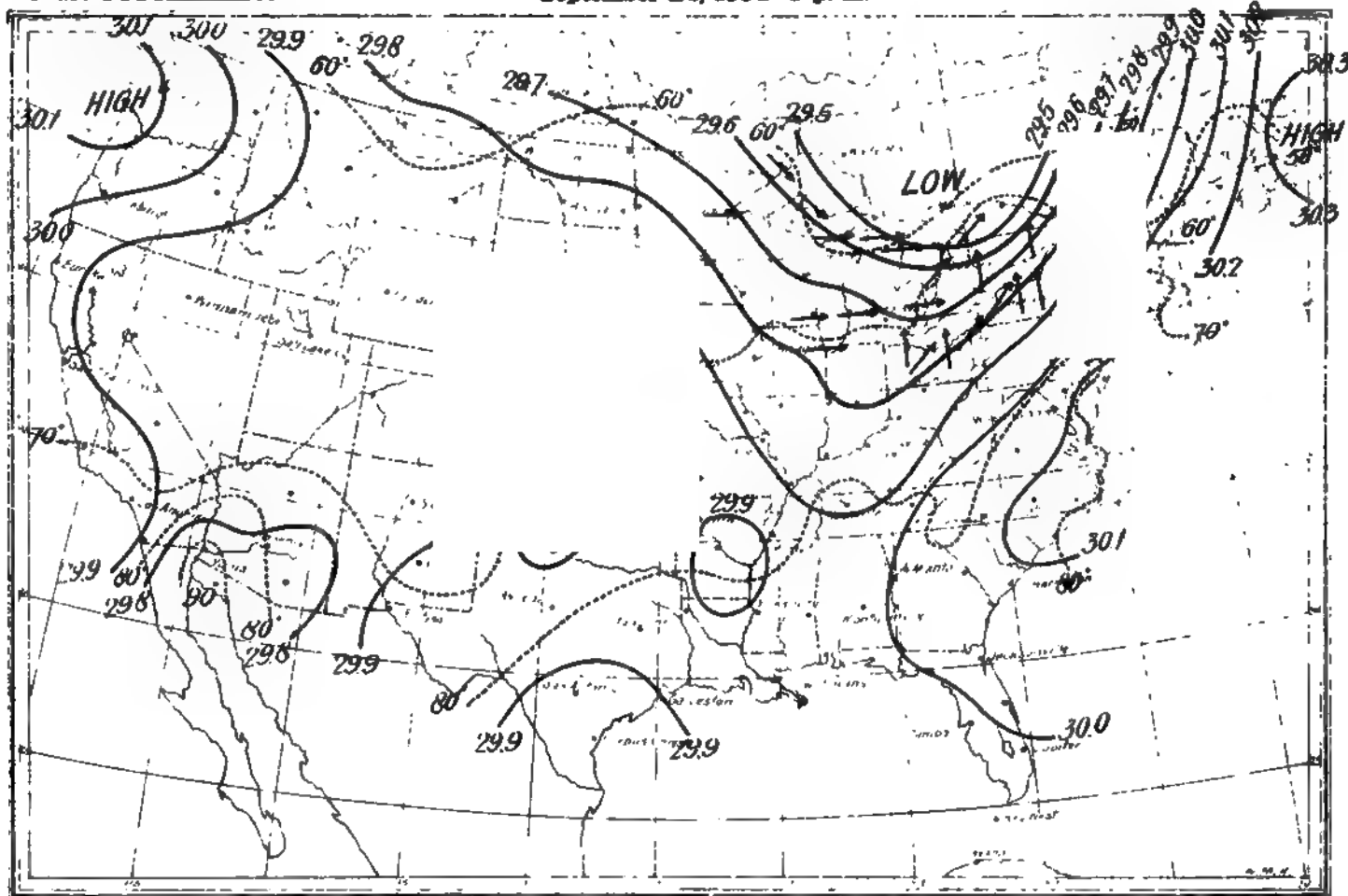


Chart CCCCXXXV.

September 7, 1885—7 a. m.

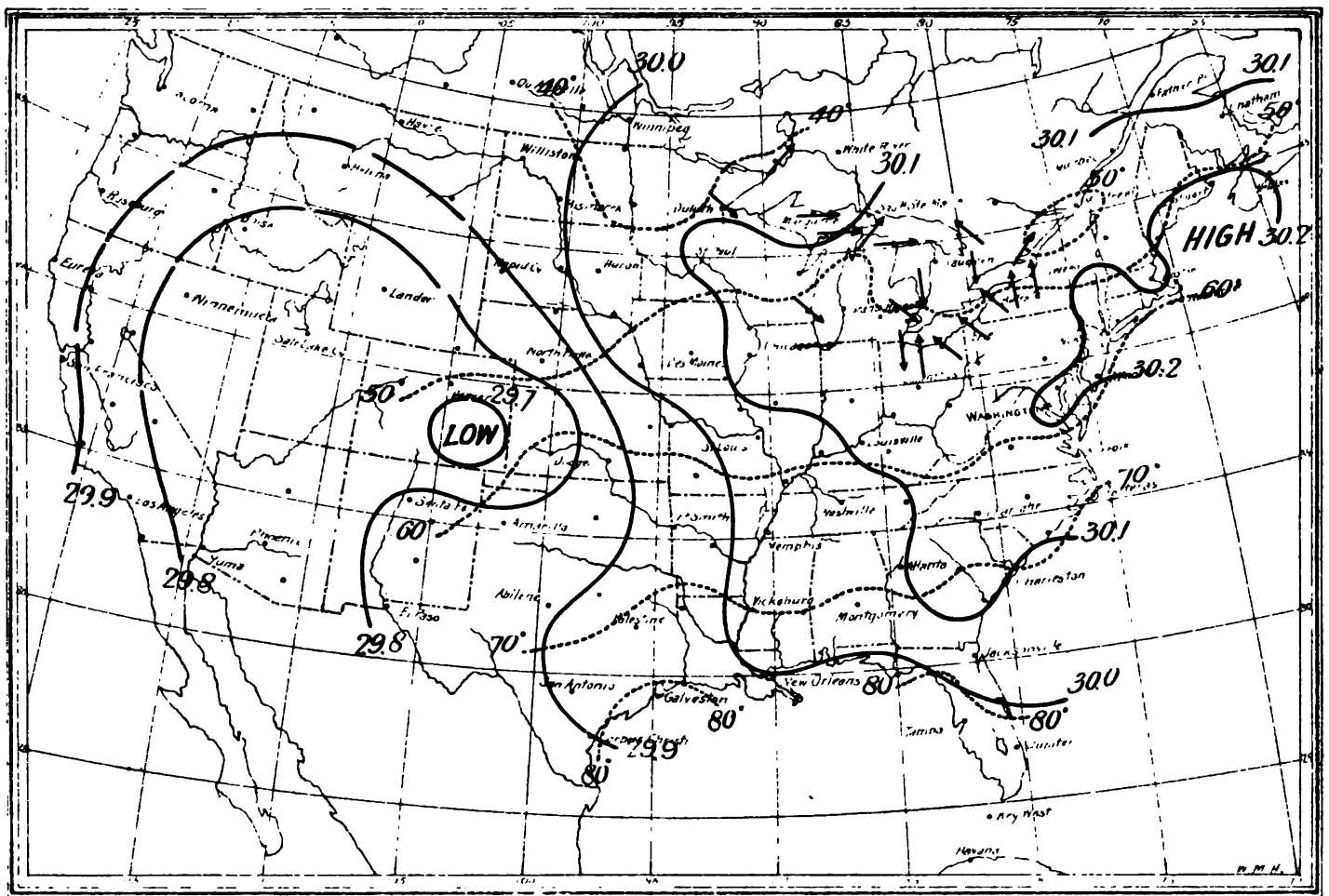


Chart CCCCXXXVI.

September 7, 1885—8 p. m.

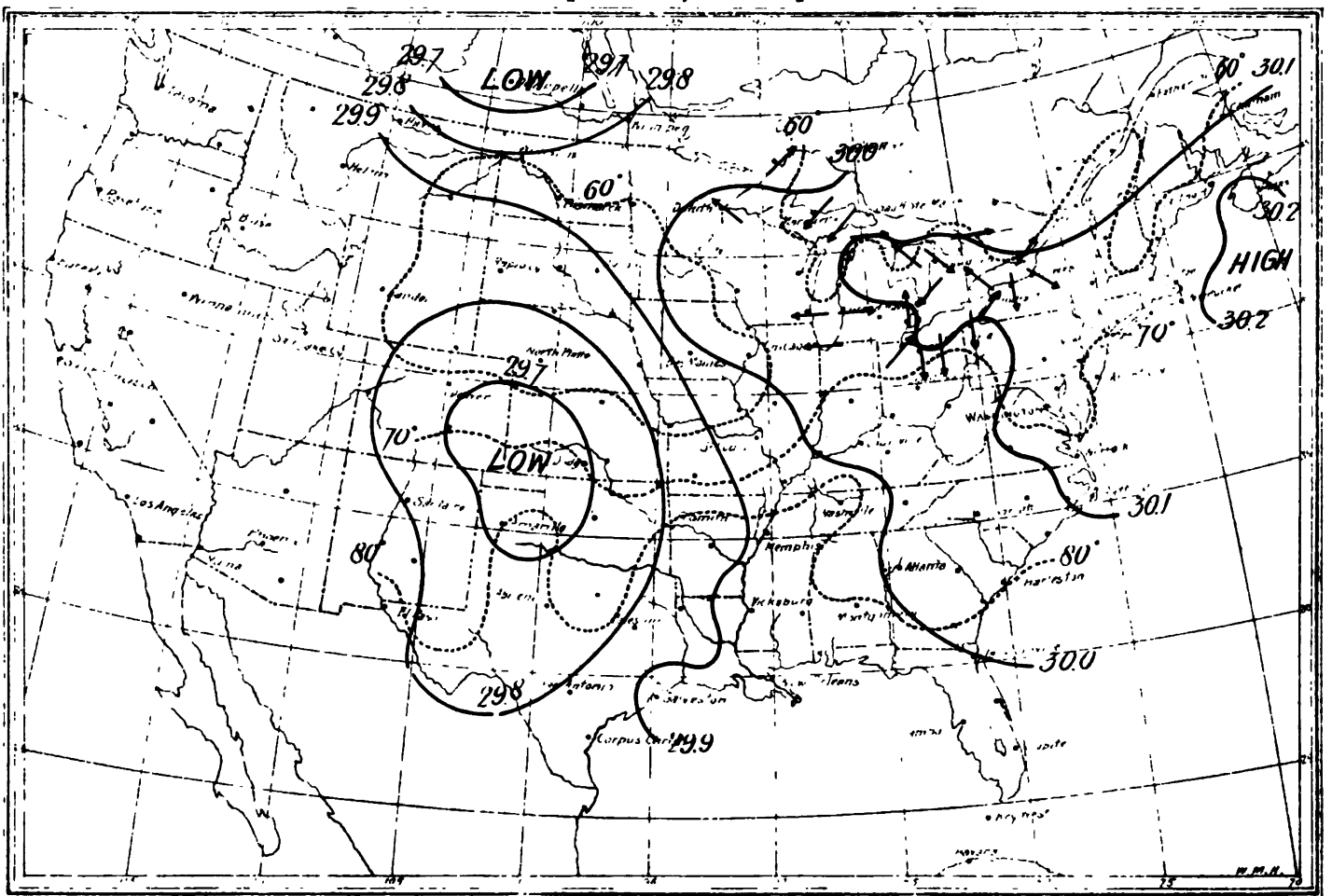


Chart 0000LXXXIII.

September 24, 1884—7 a. m.

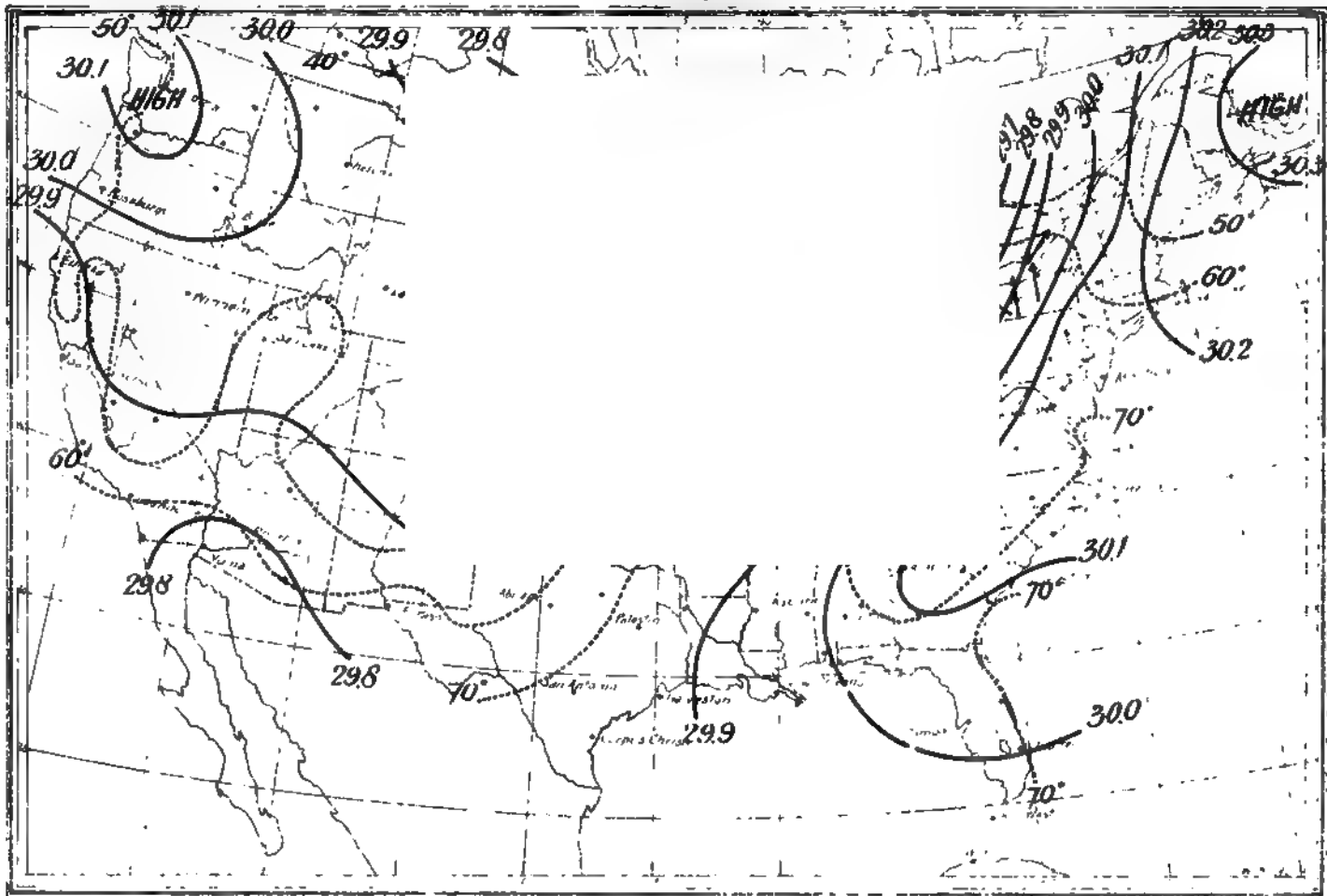


Chart 0000LXXXIV.

September 24, 1884—8 p. m.

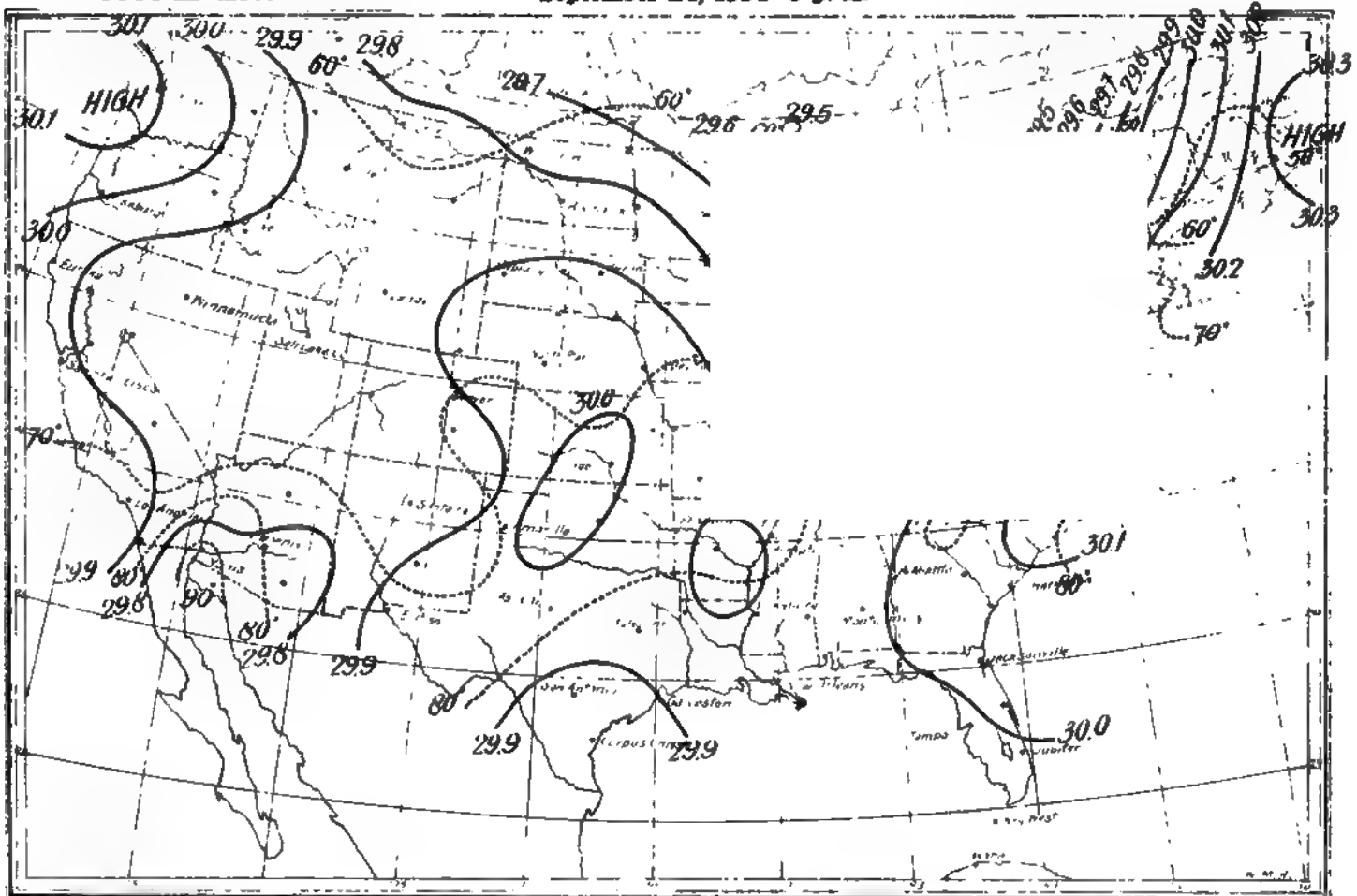


Chart 0000LXXXV.

September 7, 1885—7 a. m.

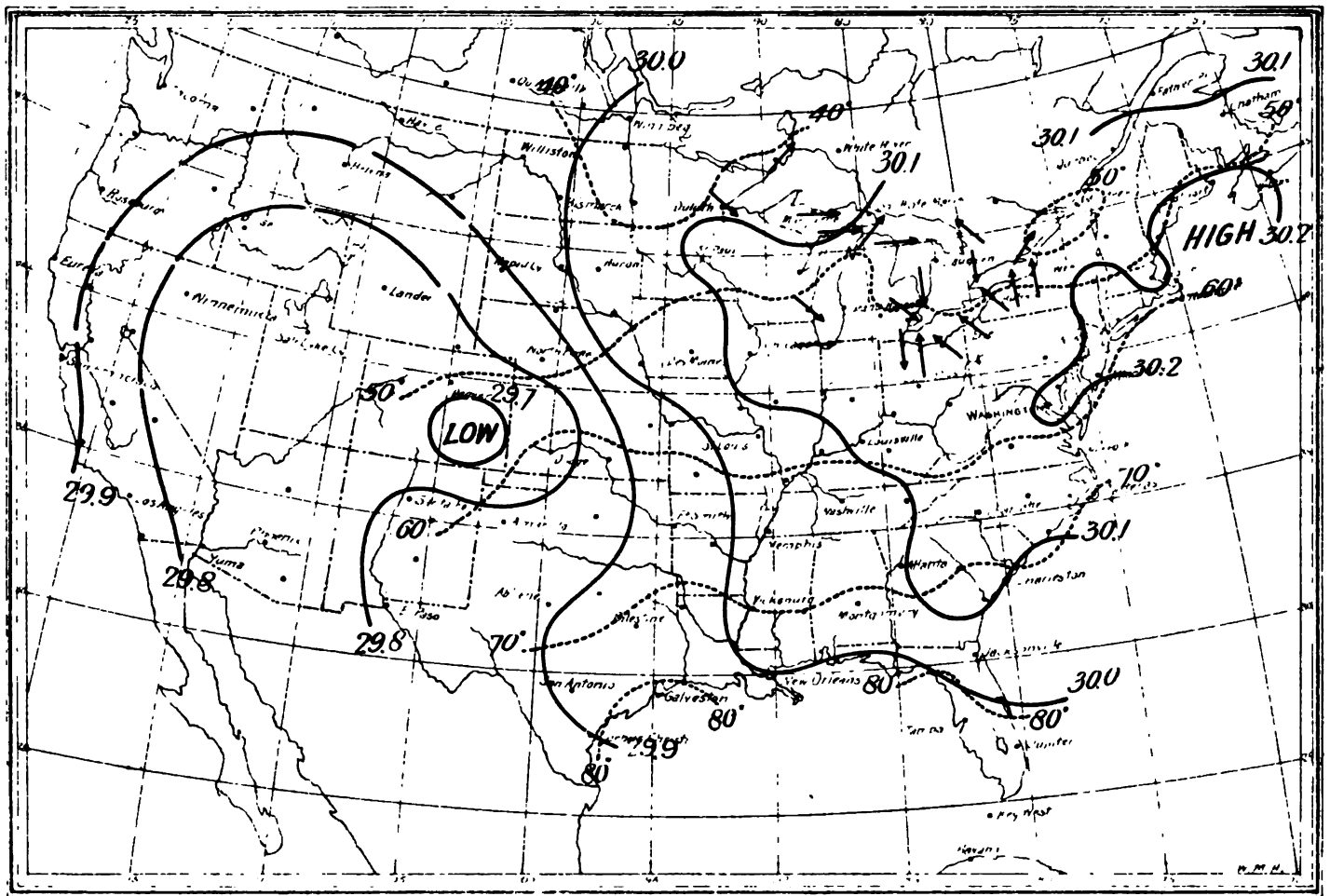


Chart 0000LXXXVI.

September 7, 1885—3 p. m.

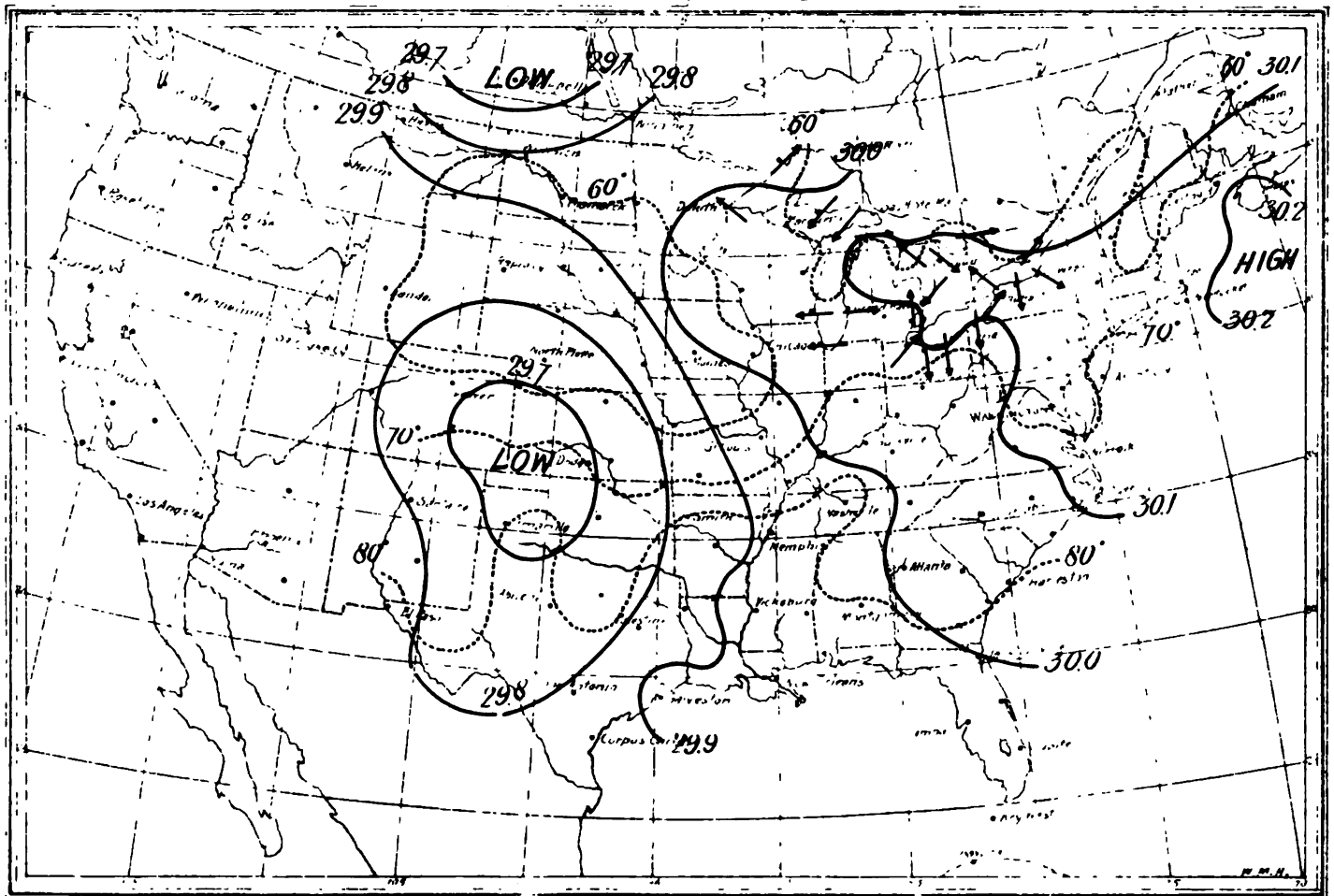


Chart 0000LXXXVII.

September 8, 1885—7 a. m.

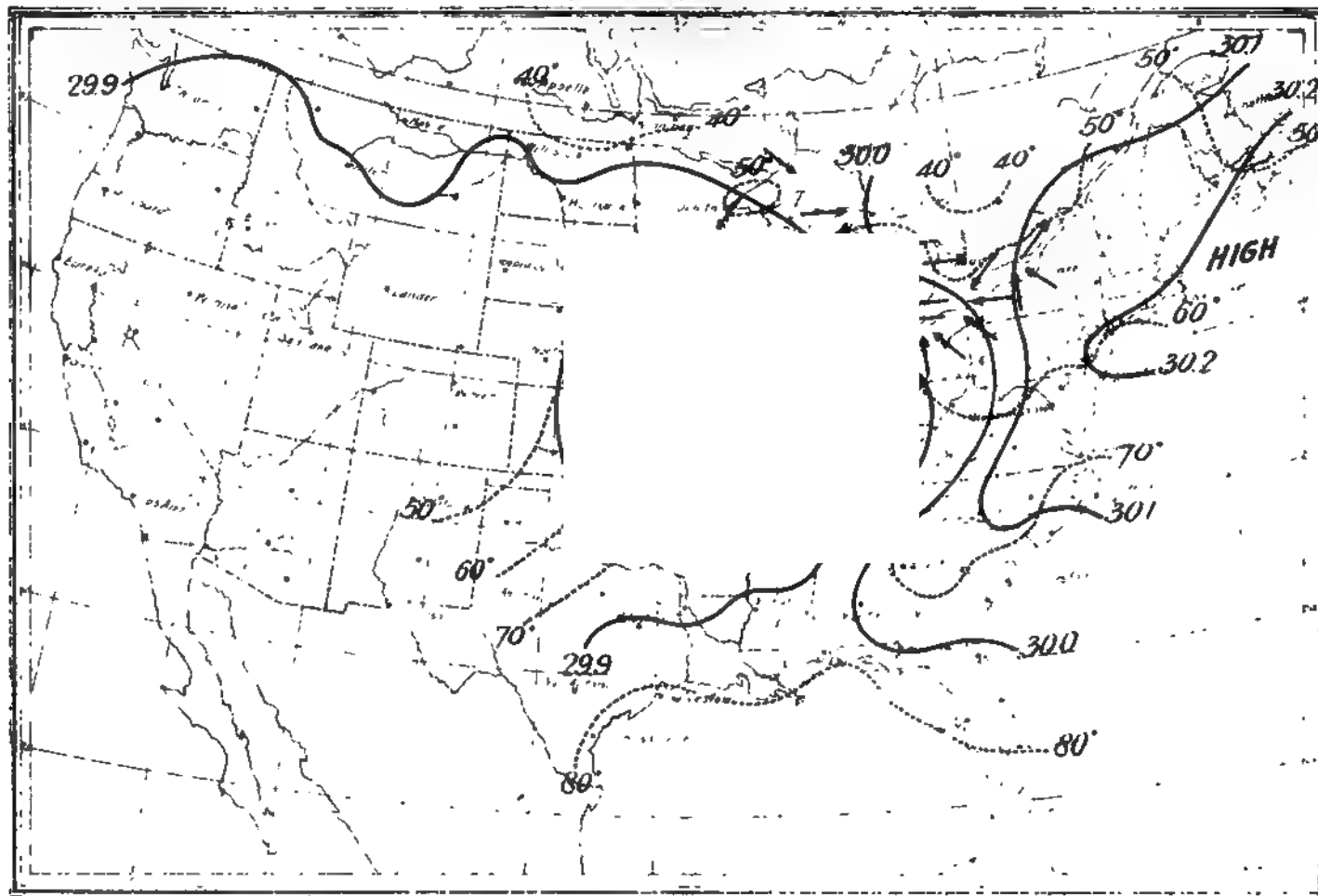
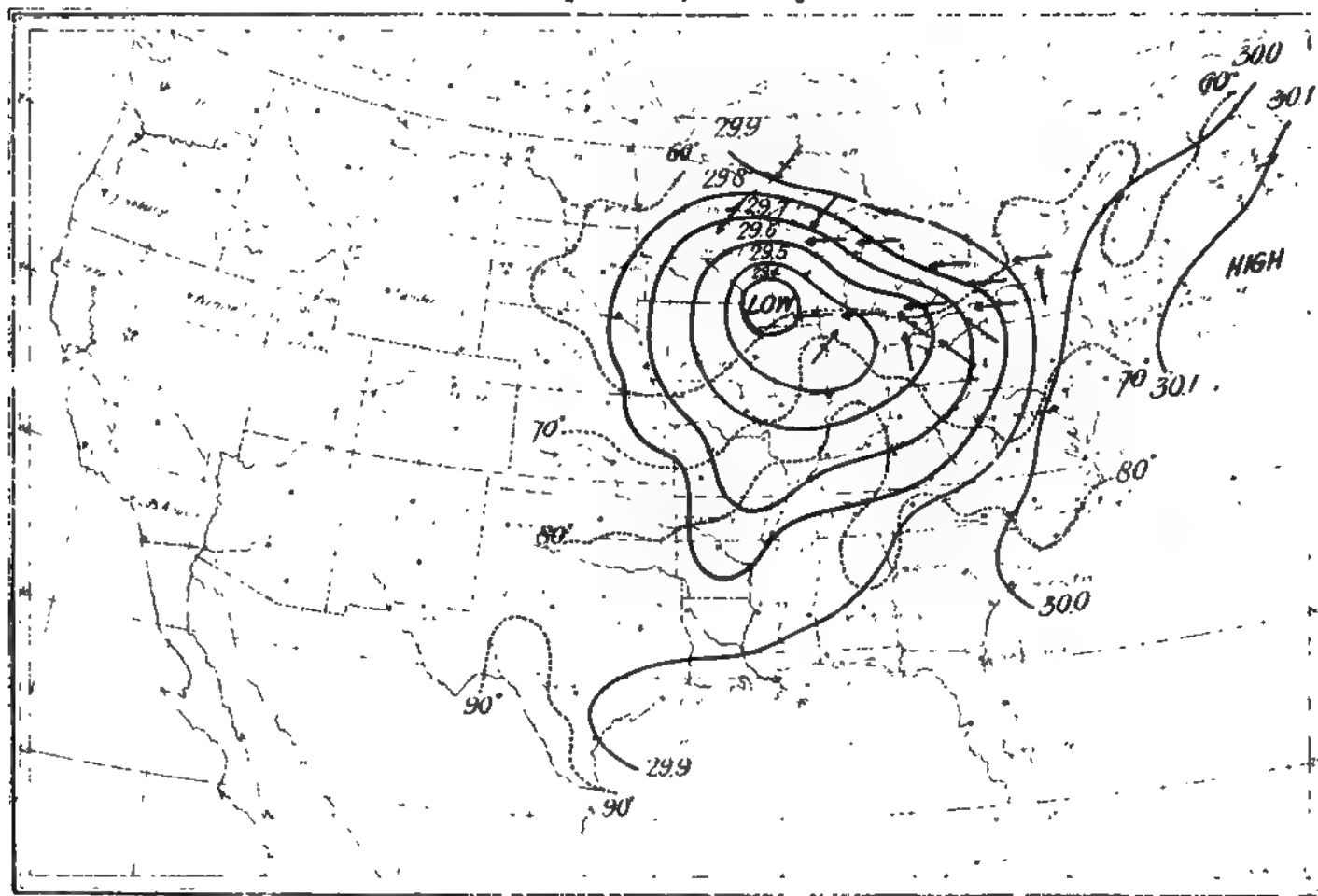


Chart 0000LXXXVIII.

September 8, 1885—8 p. m.



September 25, 1888—8 a. m.

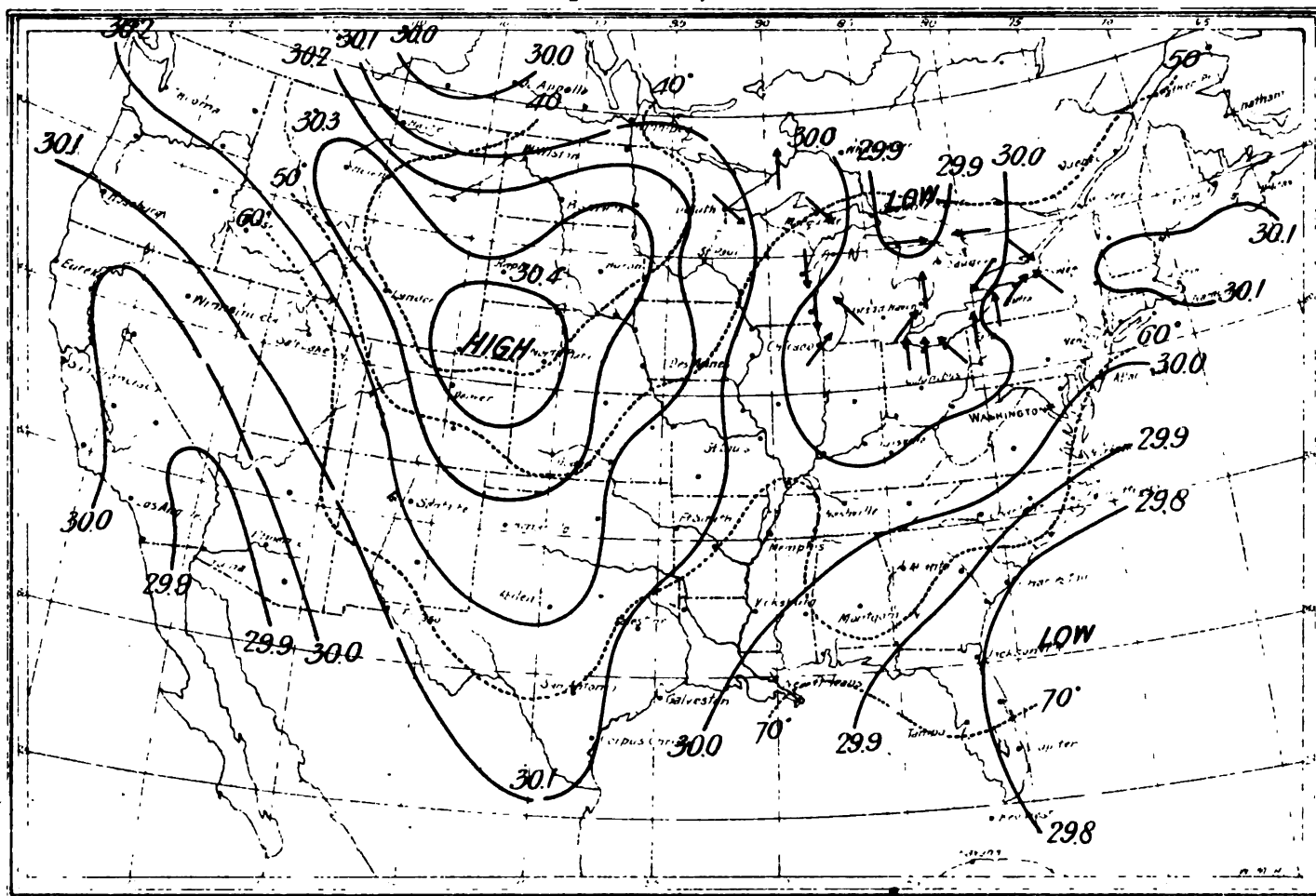


Chart 0000XXO.

September 25, 1888—8 p. m.

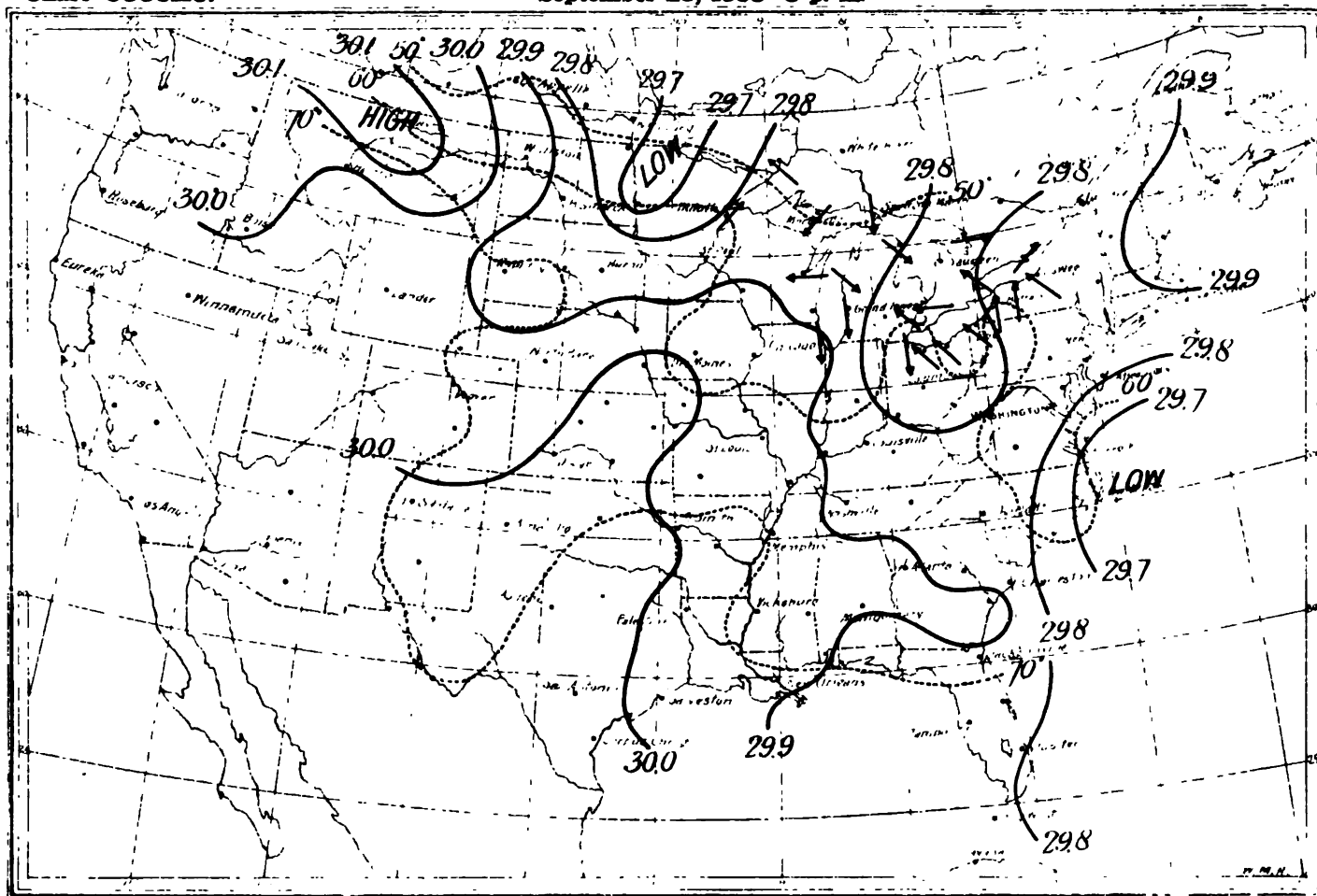


Chart 0000XOL

September 26, 1888—8 a. m.

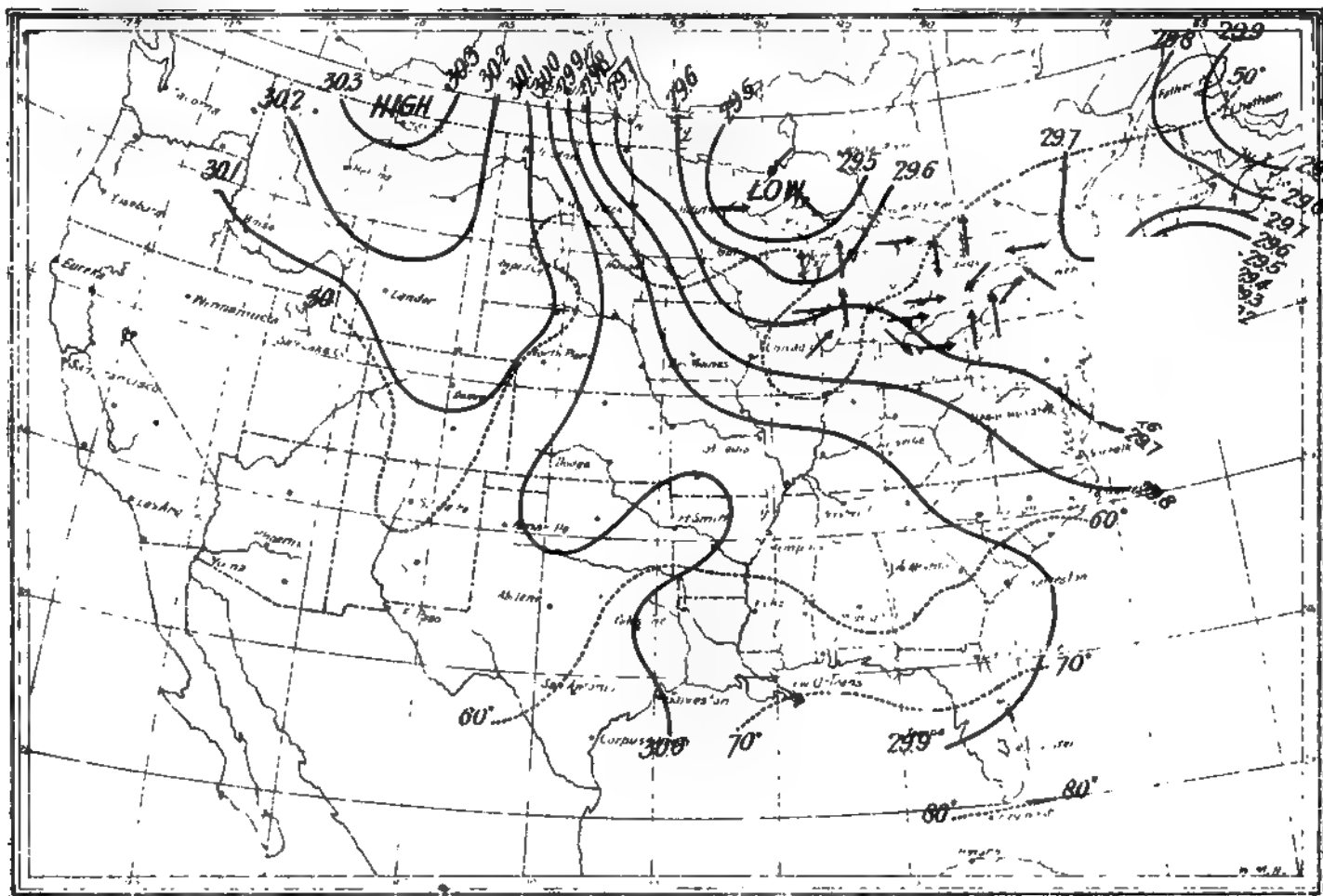


Chart 0000XOL

September 26, 1888—8 p. m.

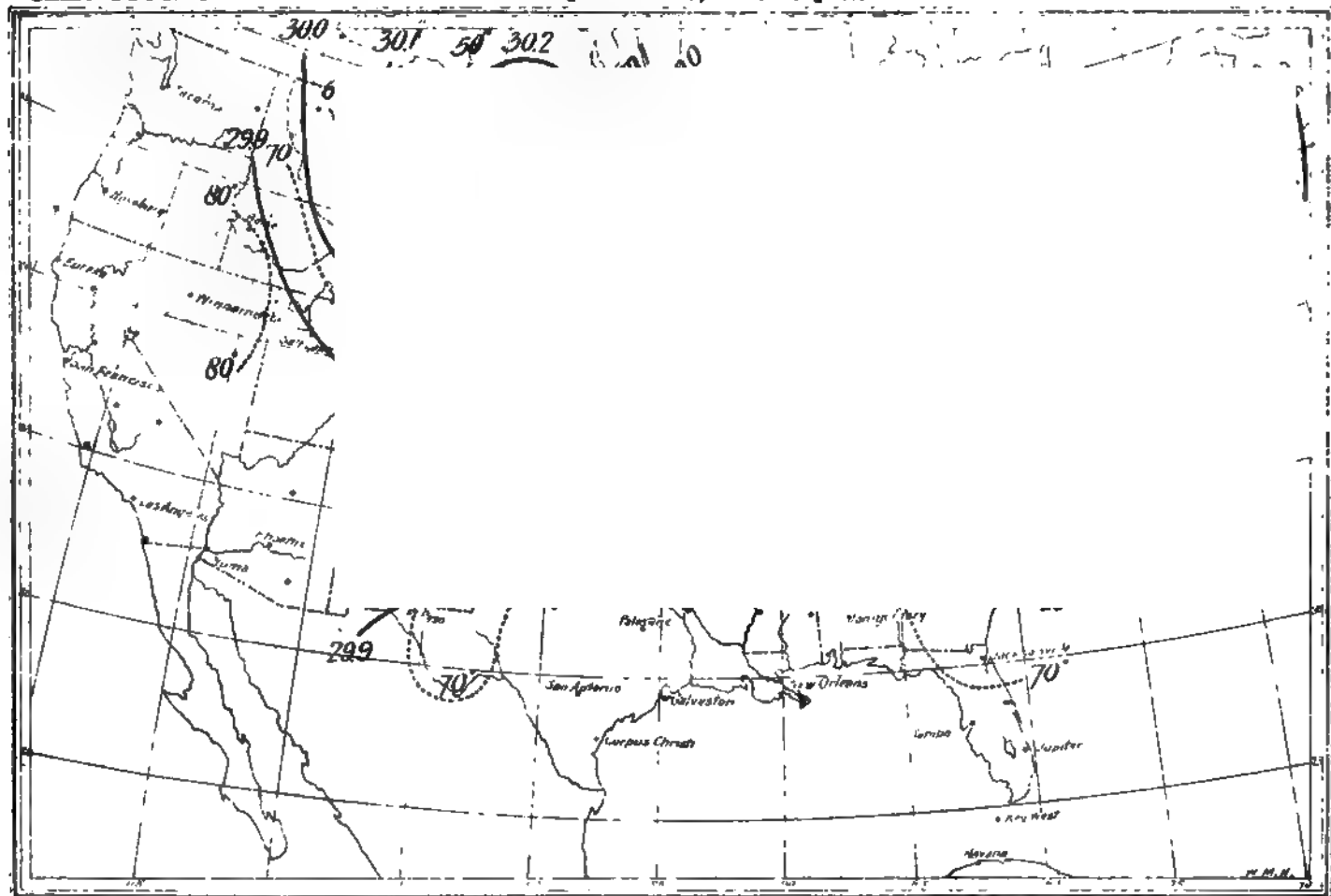


Chart 0000XIII.

September 18, 1880—8 a. m.

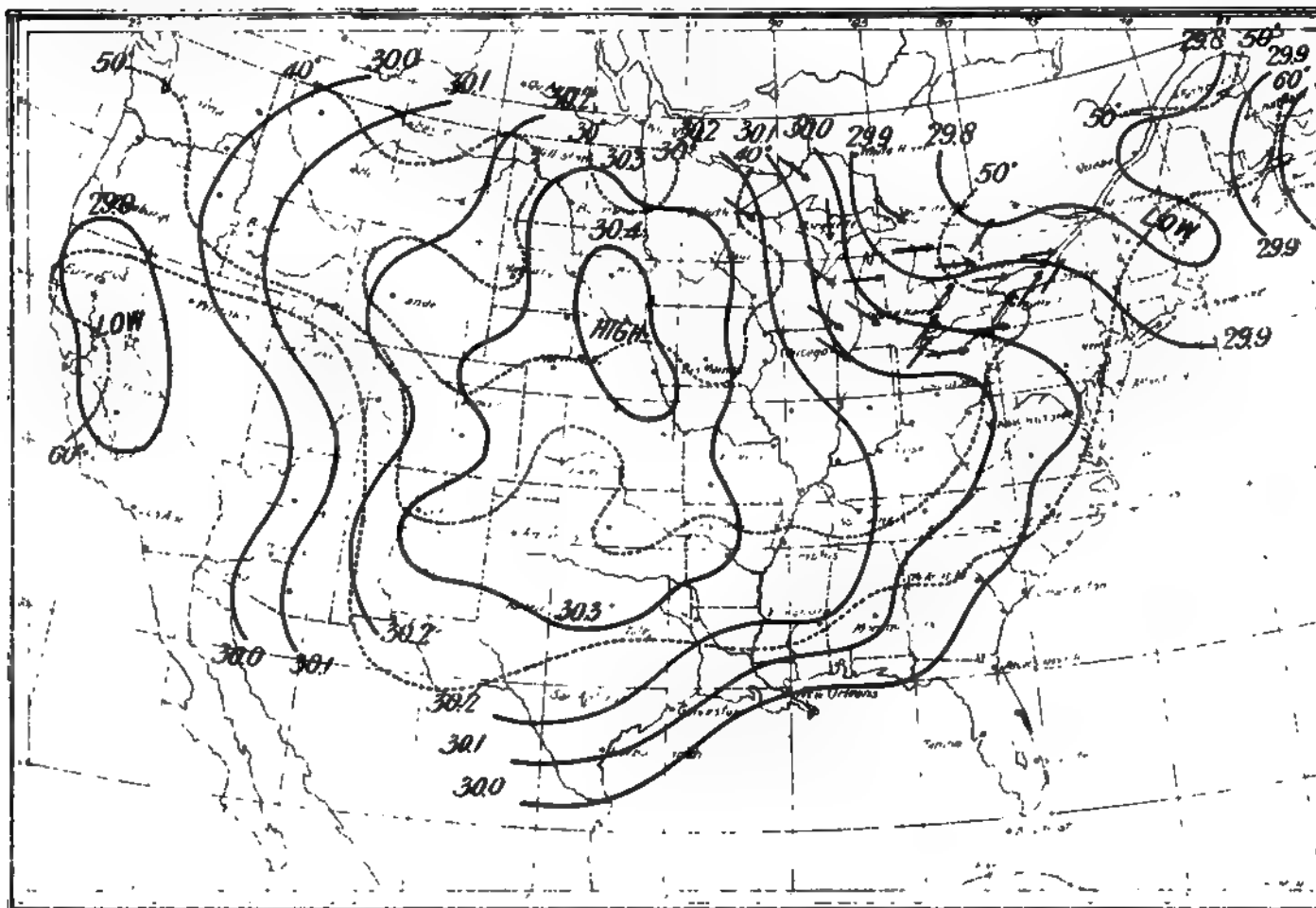
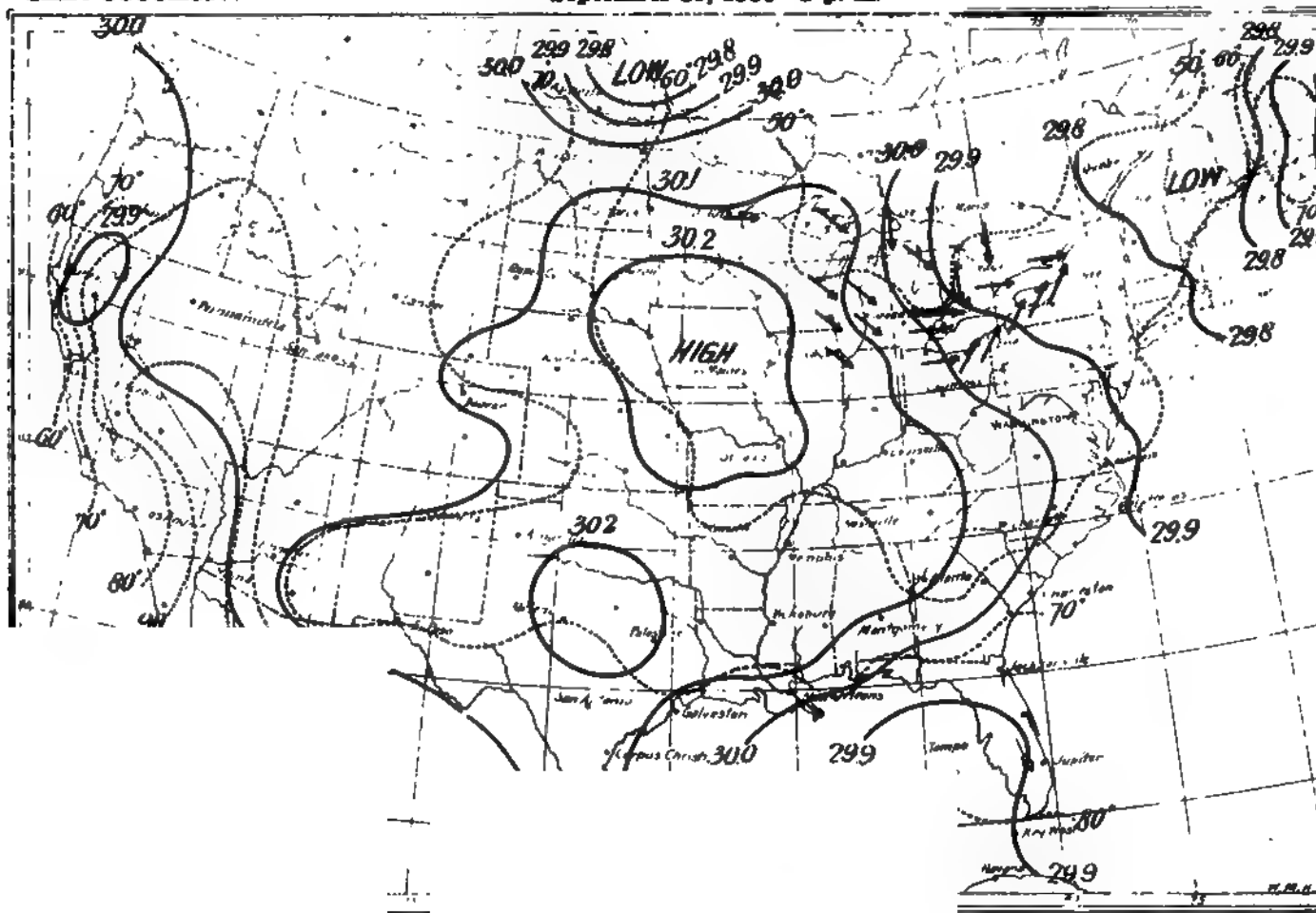


Chart 0000XIV.

September 18, 1880—8 p. m.



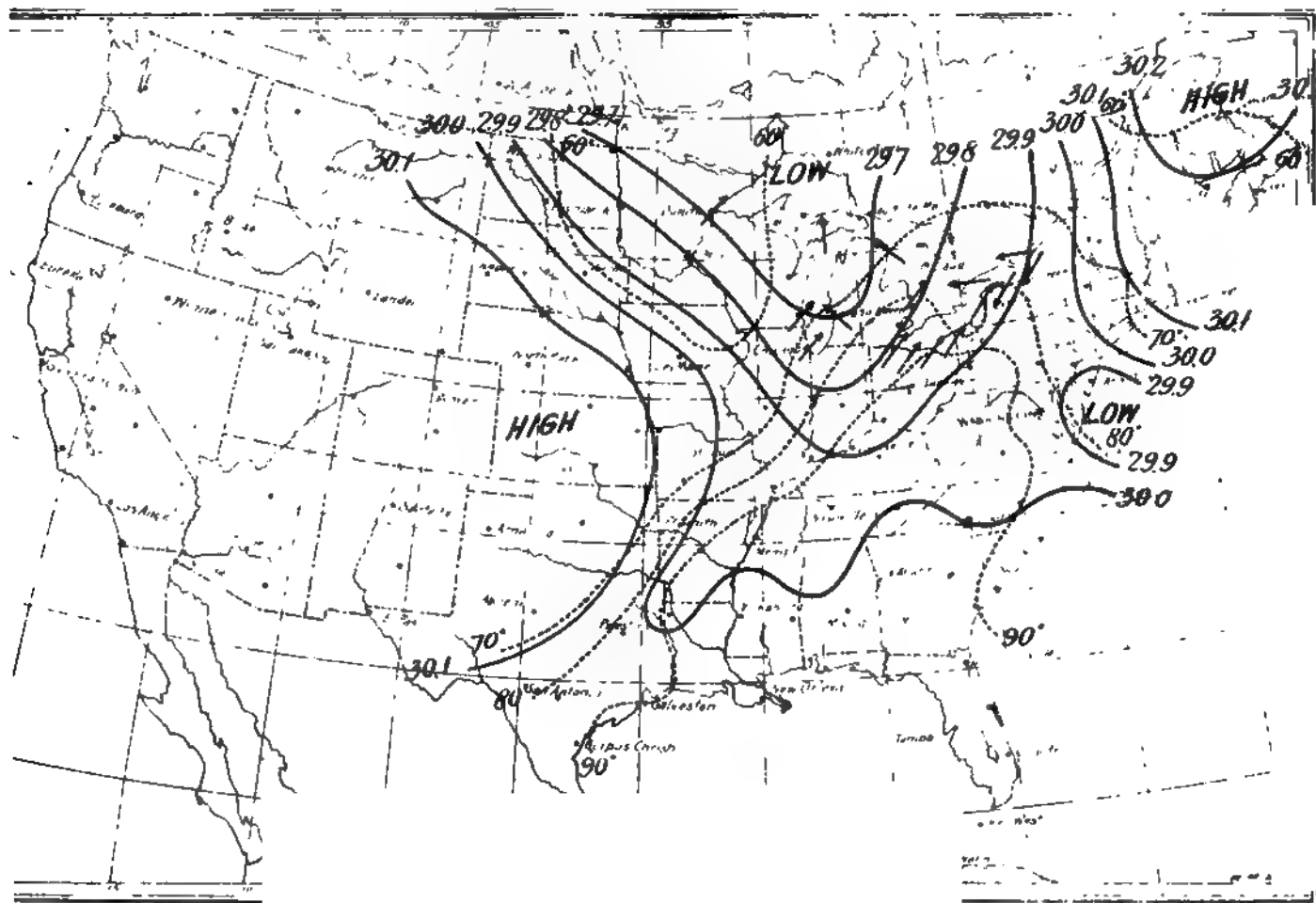
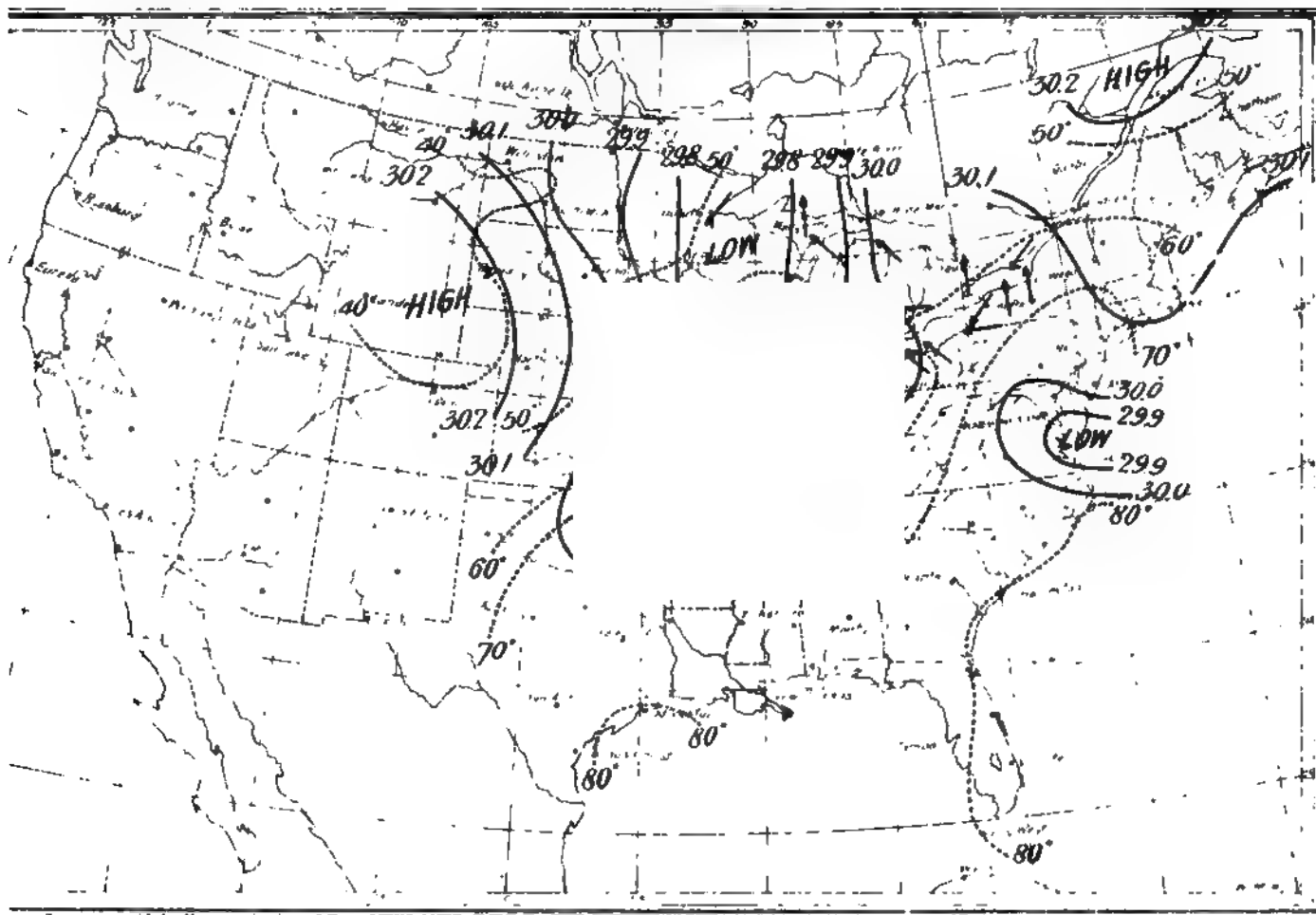


Chart 0000LXIX.

September 28, 1881—7 a. m.

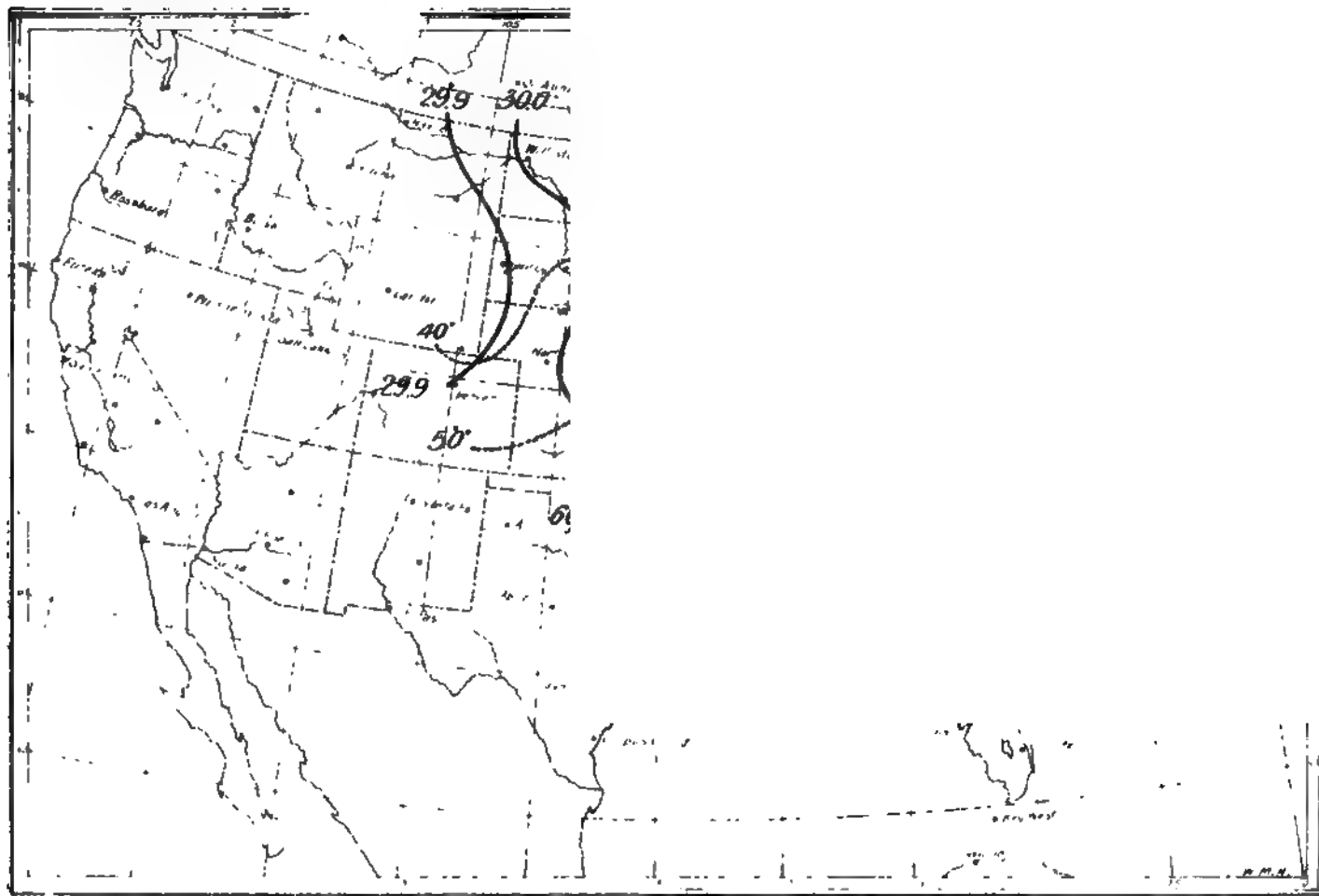


Chart 0000LXX.

September 28, 1881—8 p. m.

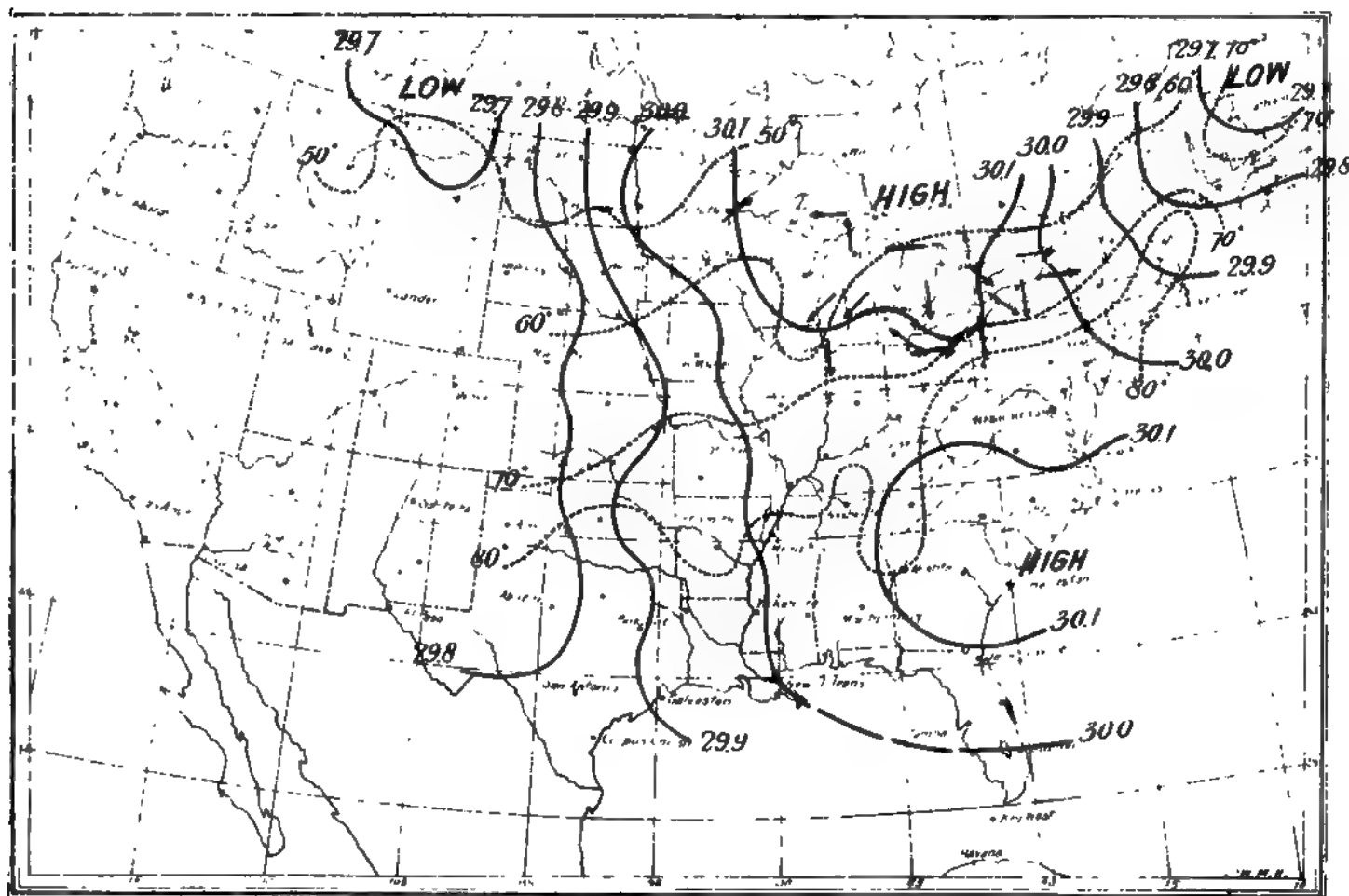


Chart 0000LXXI

September 29, 1881—7 a. m.

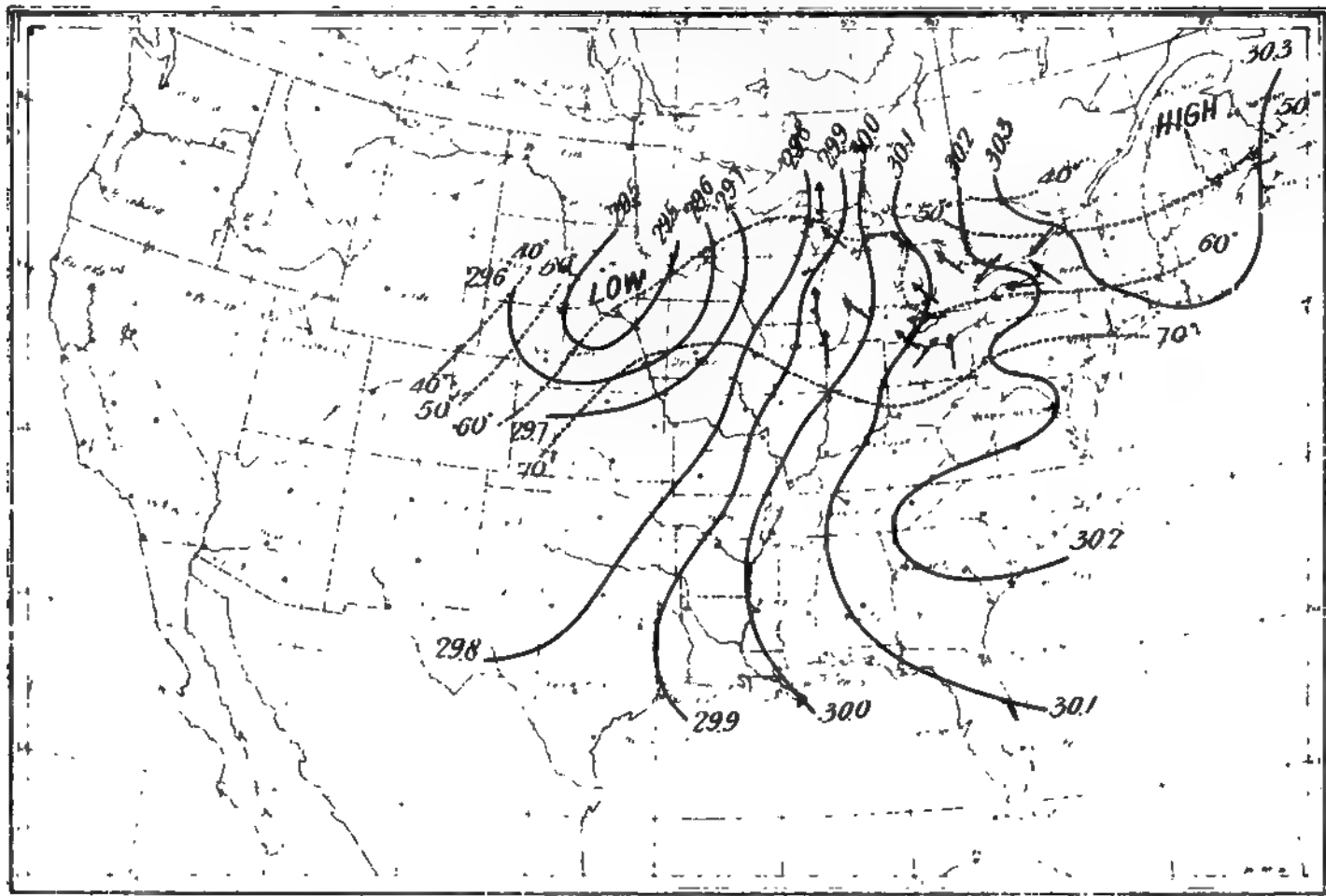
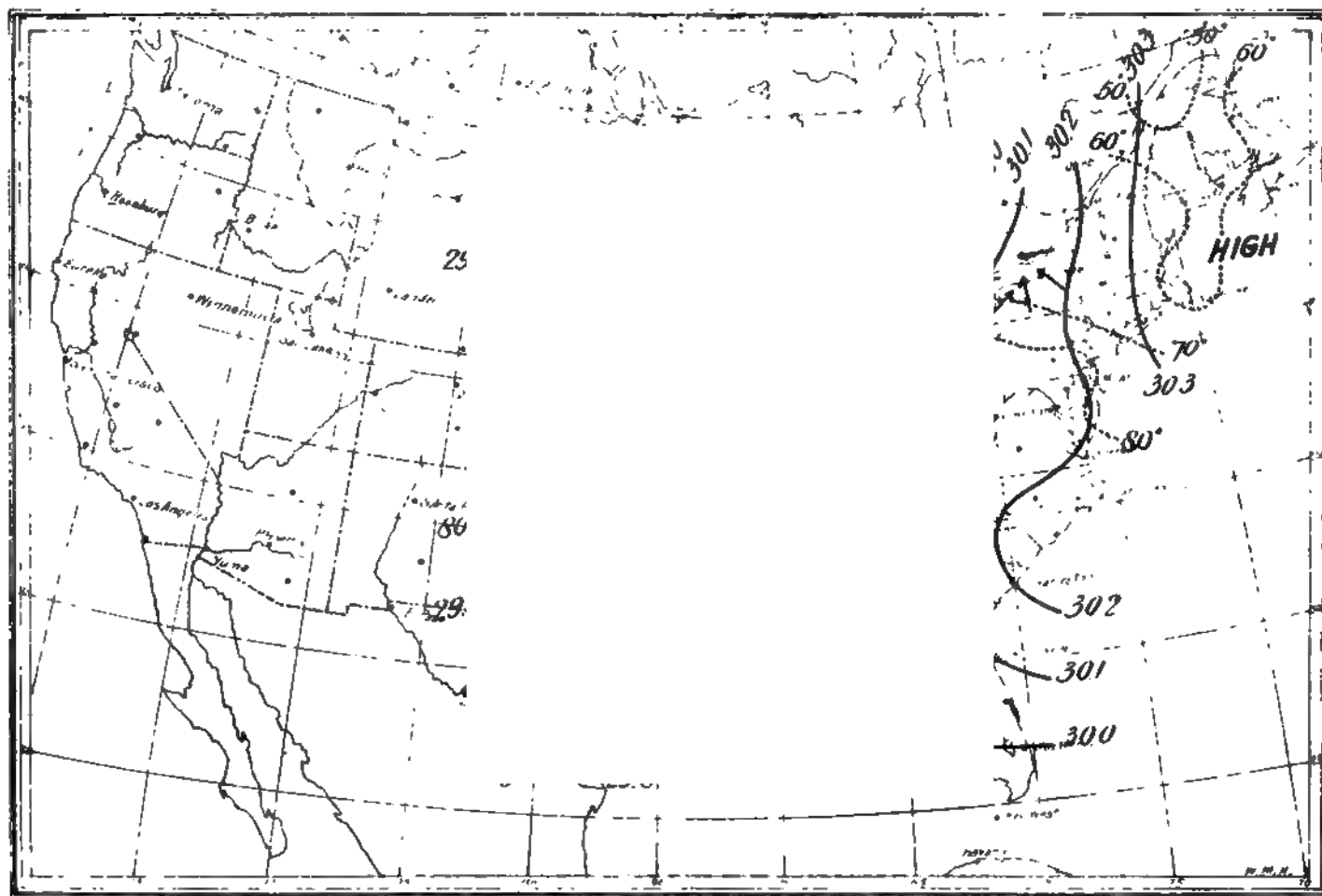


Chart 0000LXXII

September 29, 1881—8 p. m.



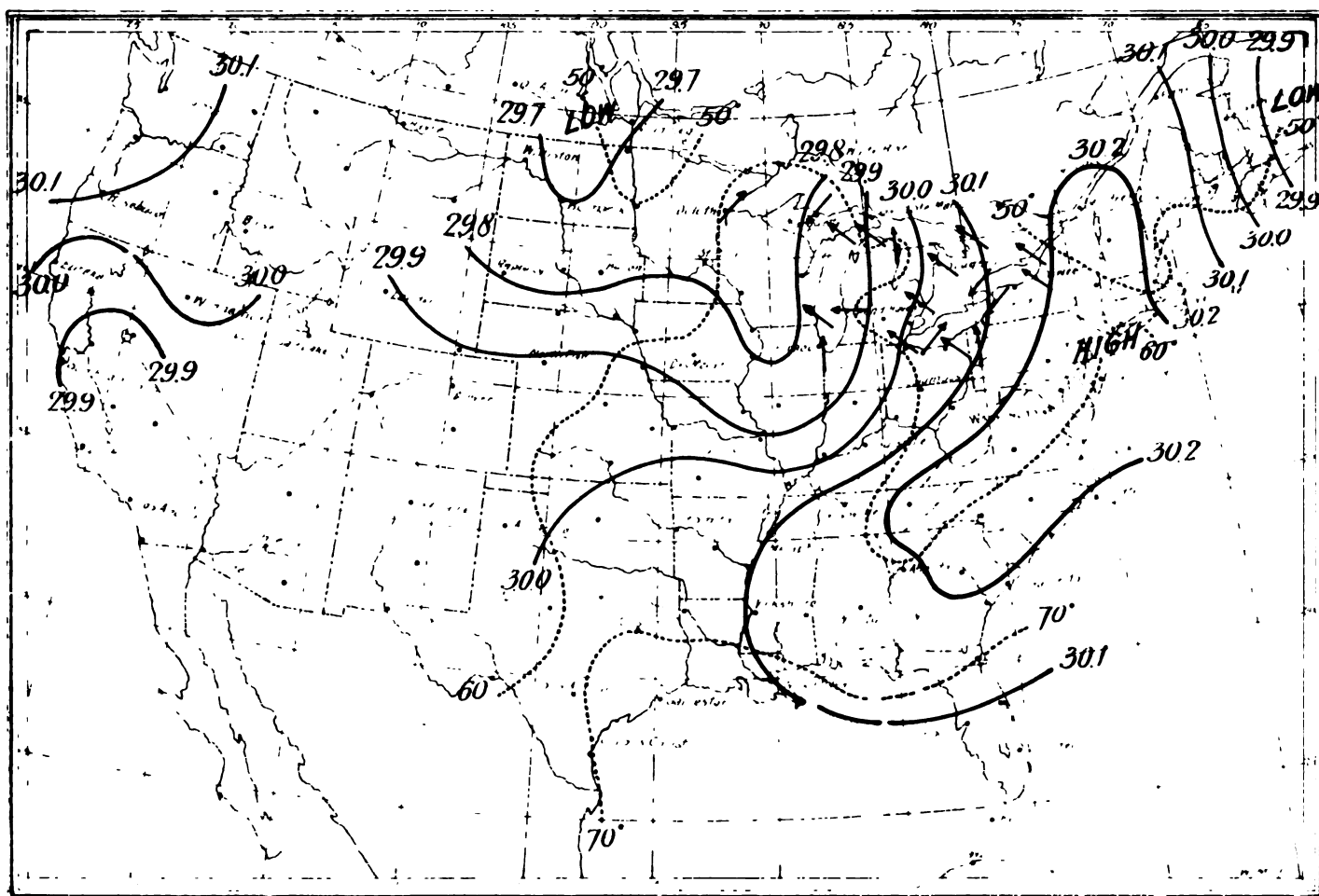
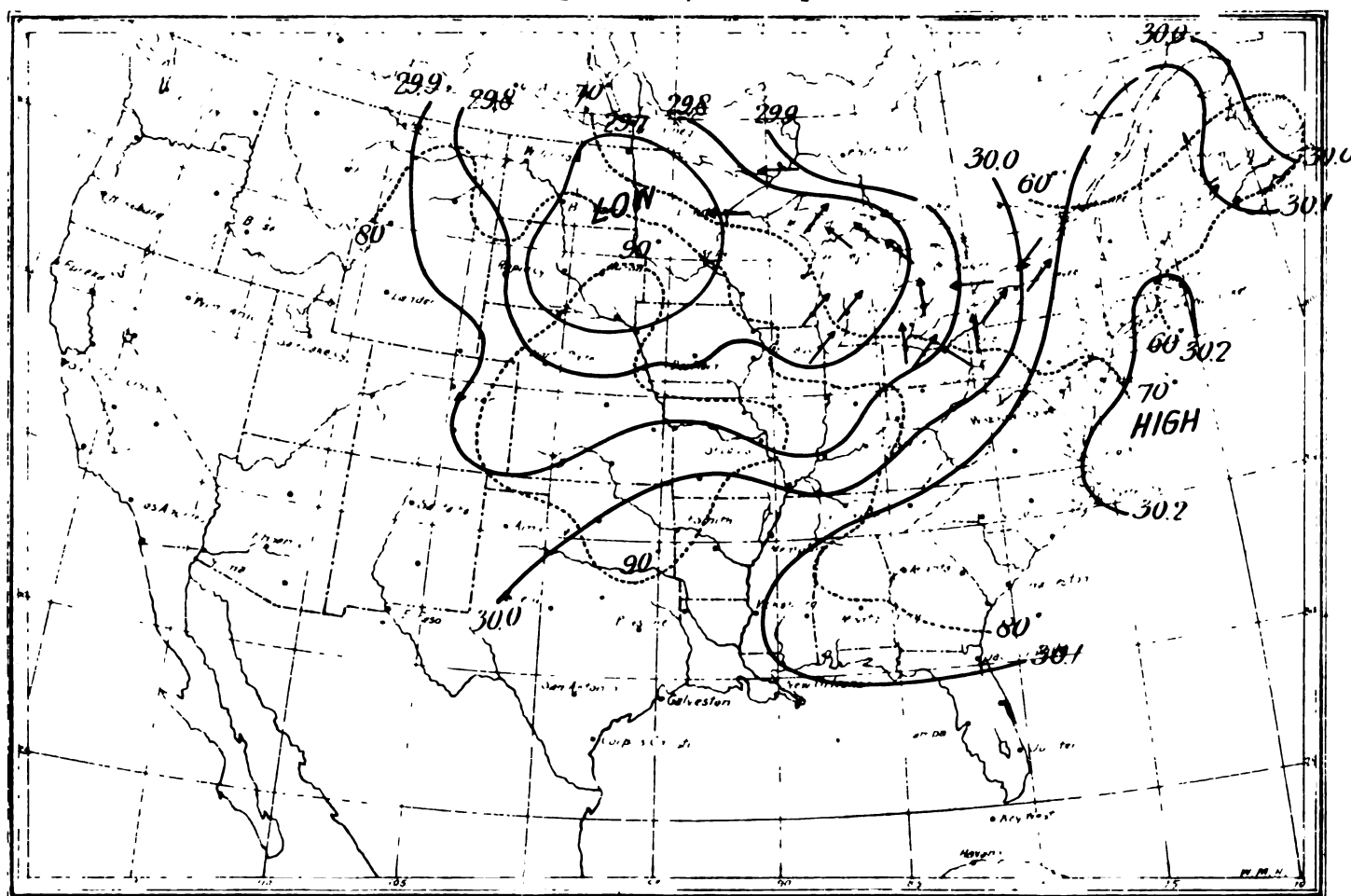


Chart CCCCXXXIV.

September 13, 1882—3 p. m.



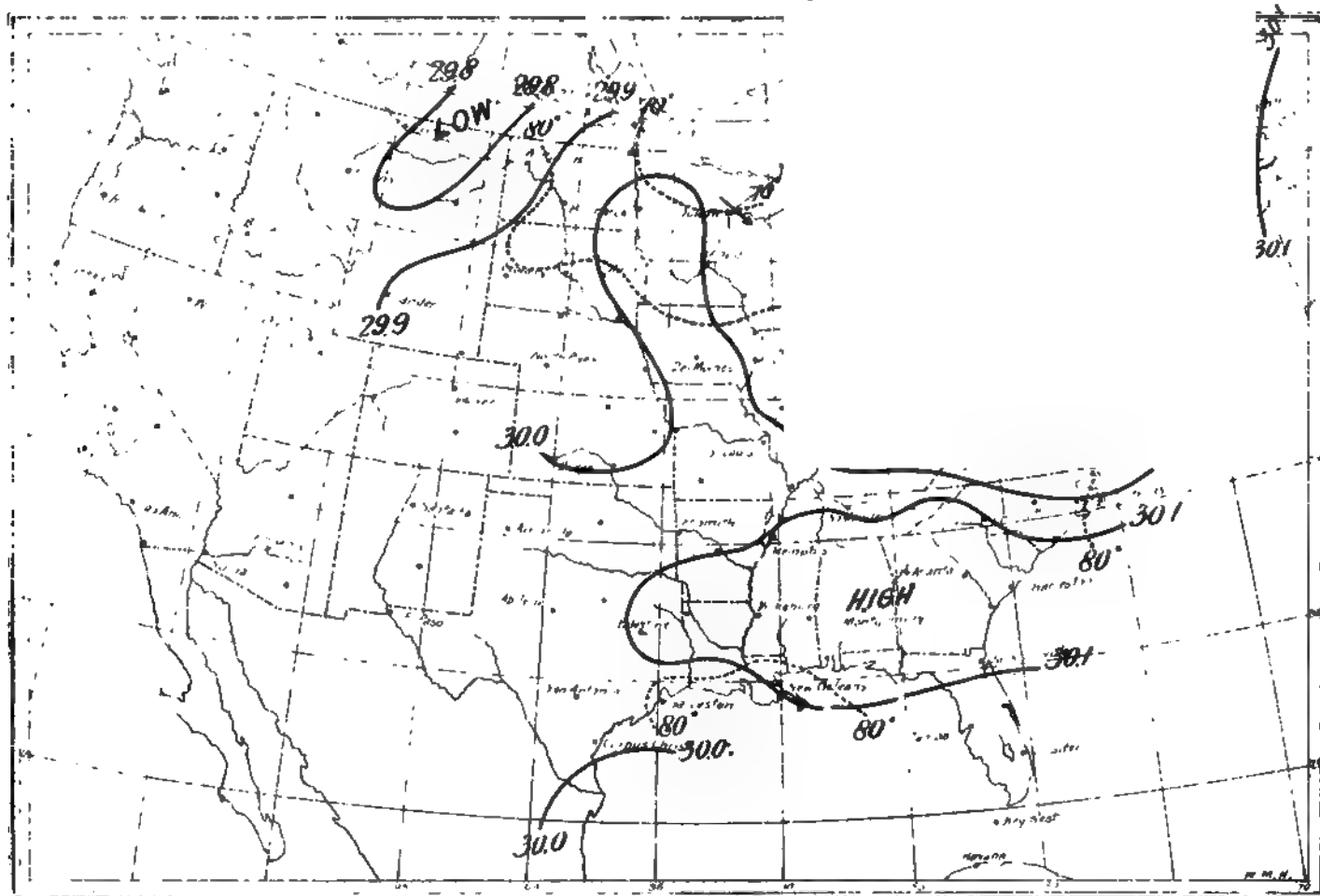
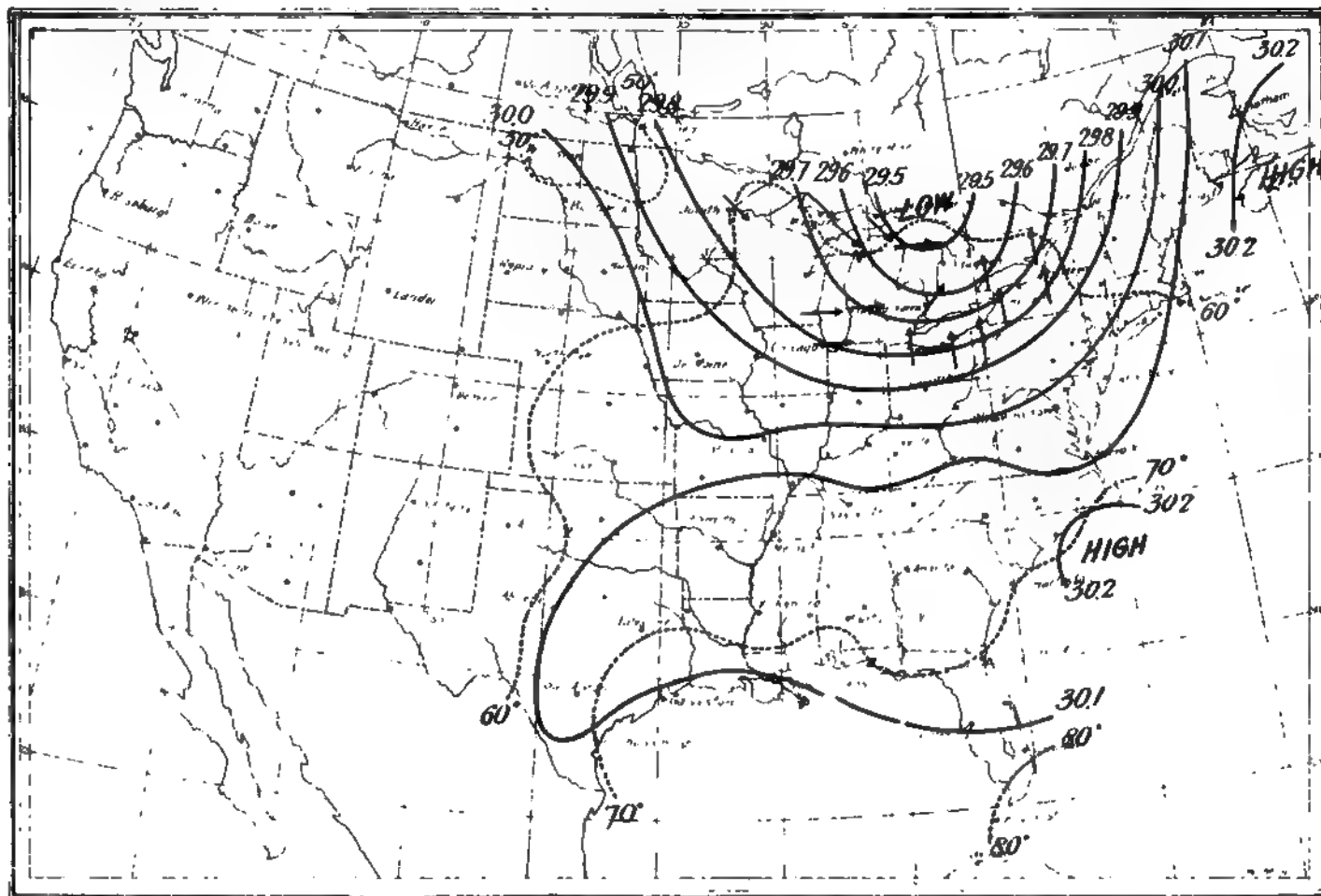


Chart 0000LXXVII

September 23, 1888—7 a. m.

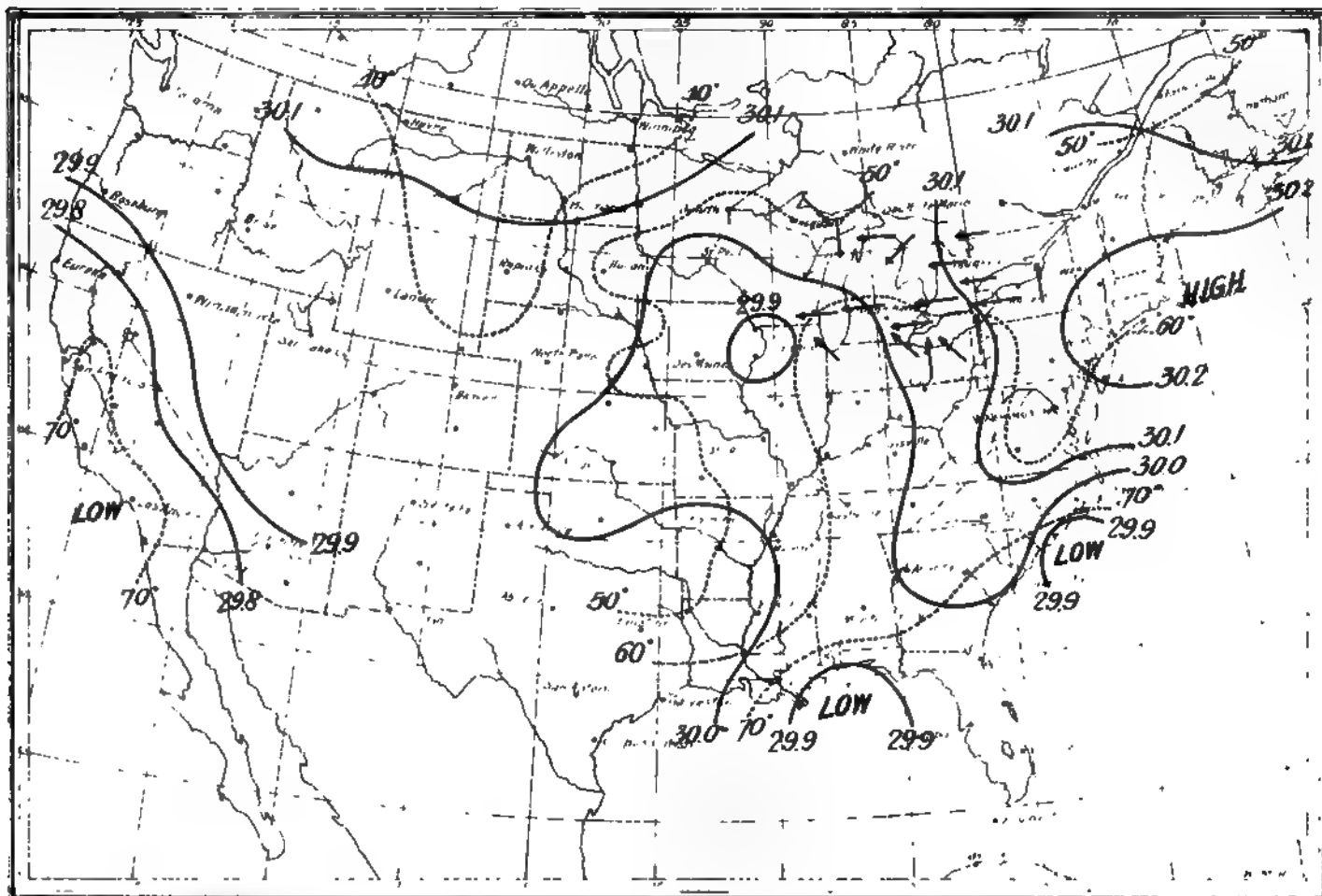
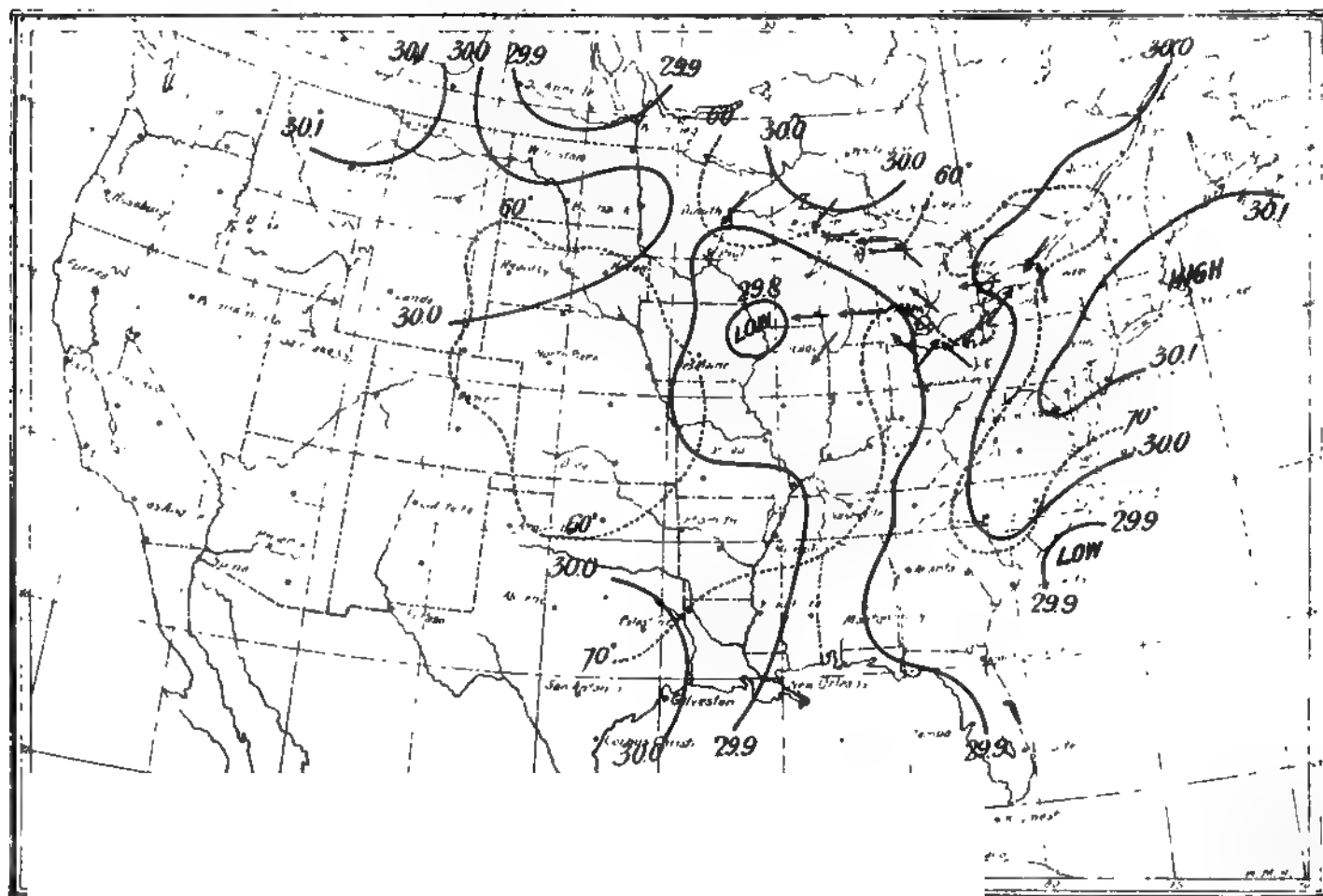
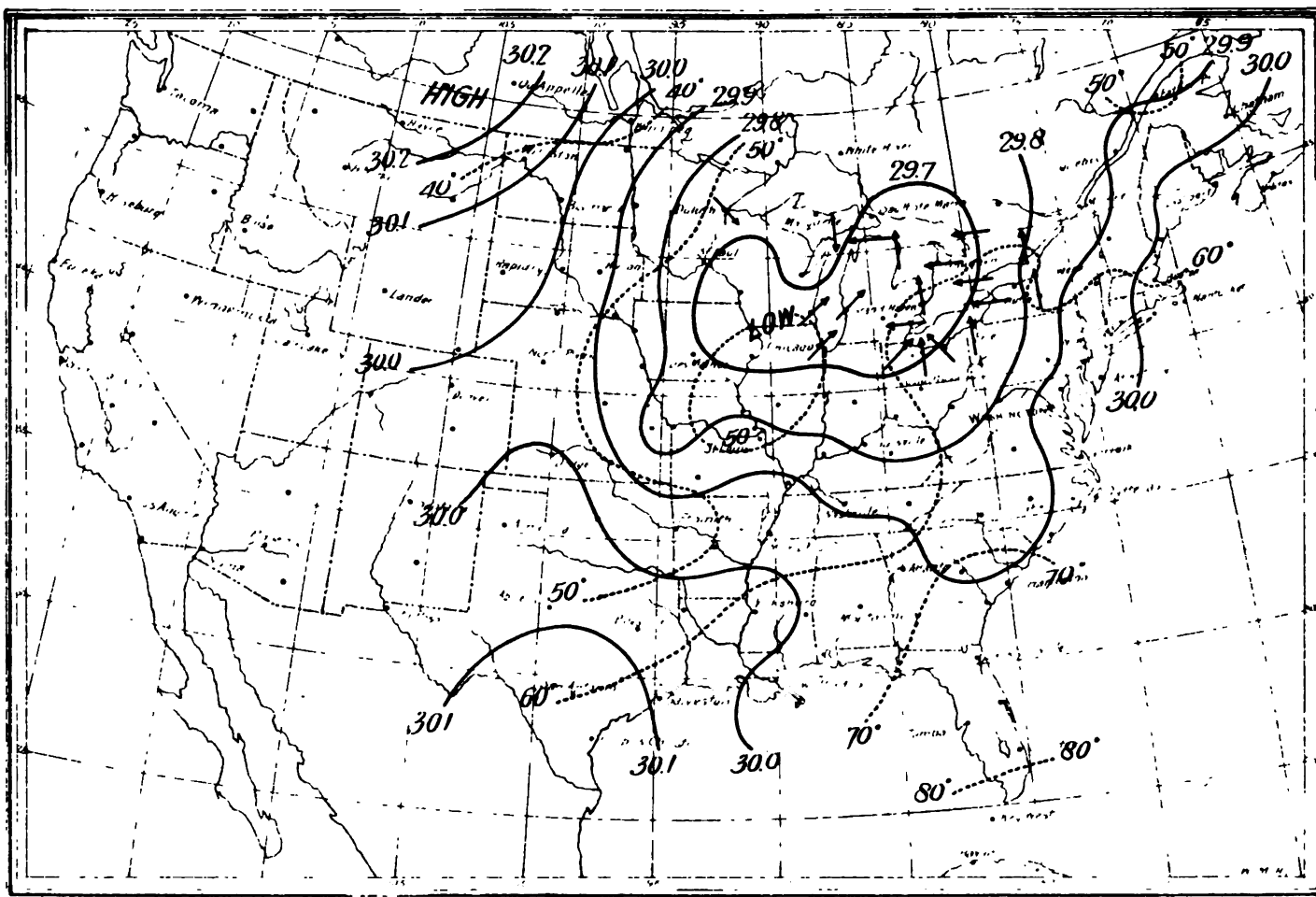


Chart 0000LXXVIII

September 23, 1888—3 p. m.





September 24, 1888—8 p. m.

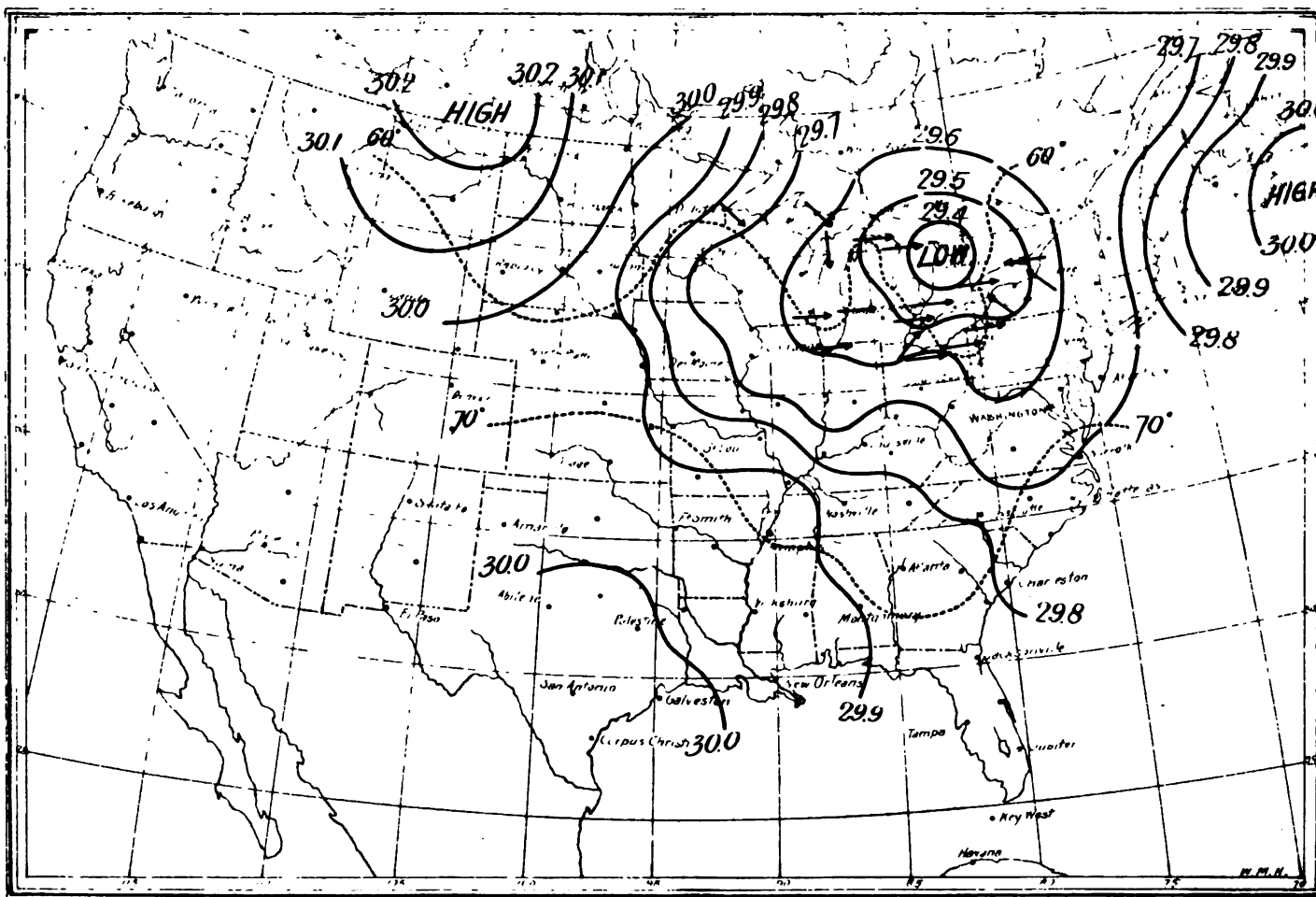


Chart 0000LXXXI.

September 28, 1884—7 a. m.

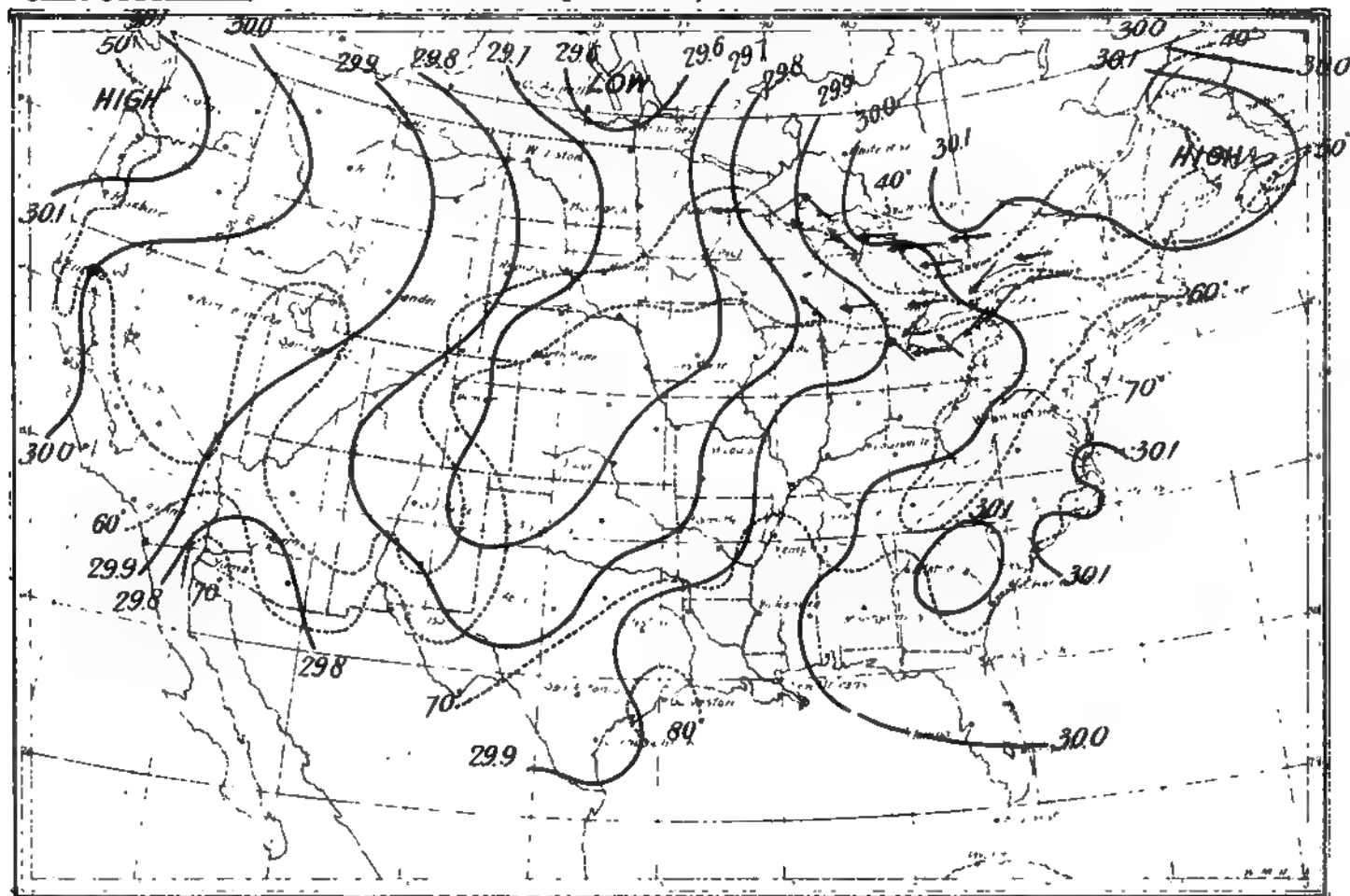
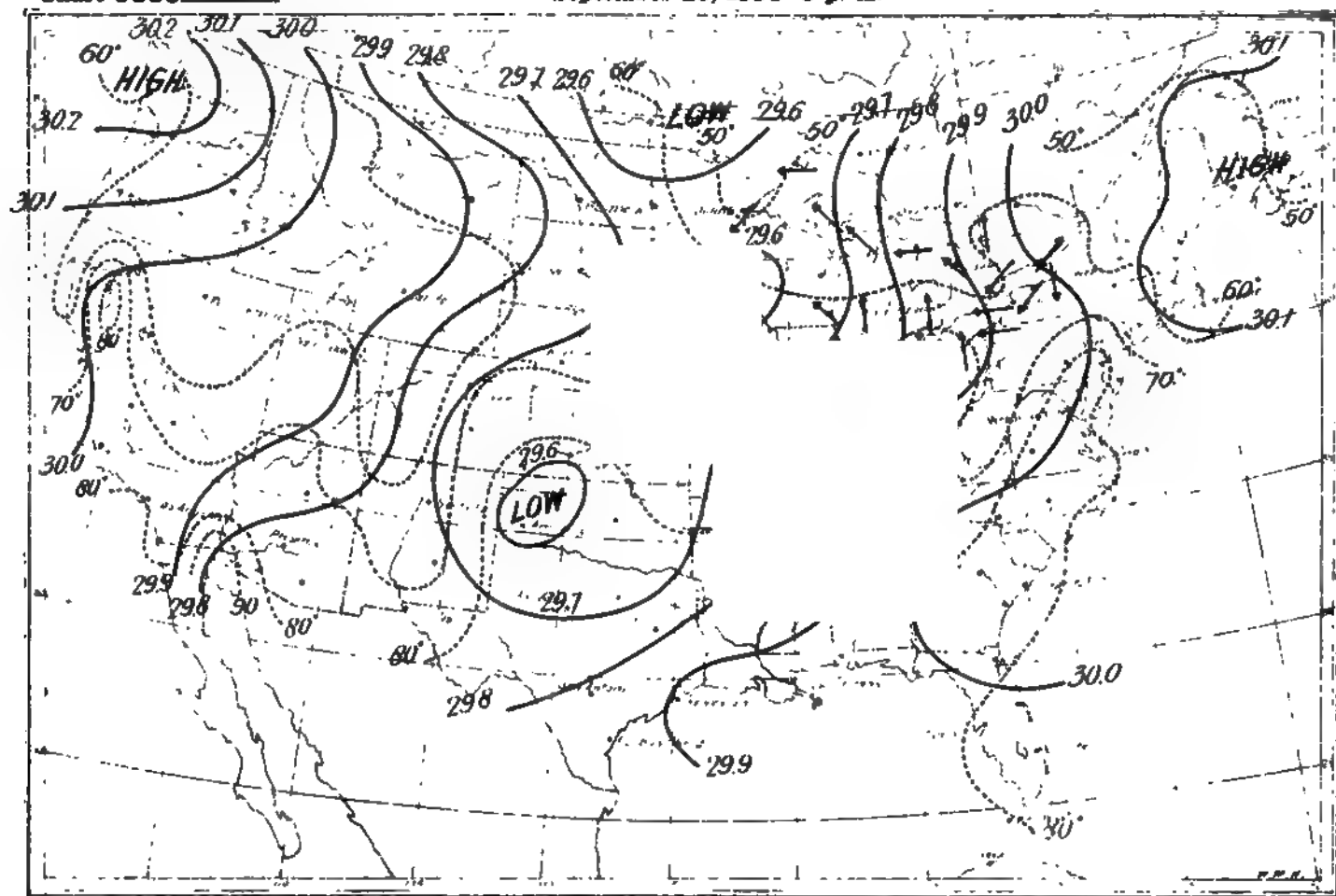
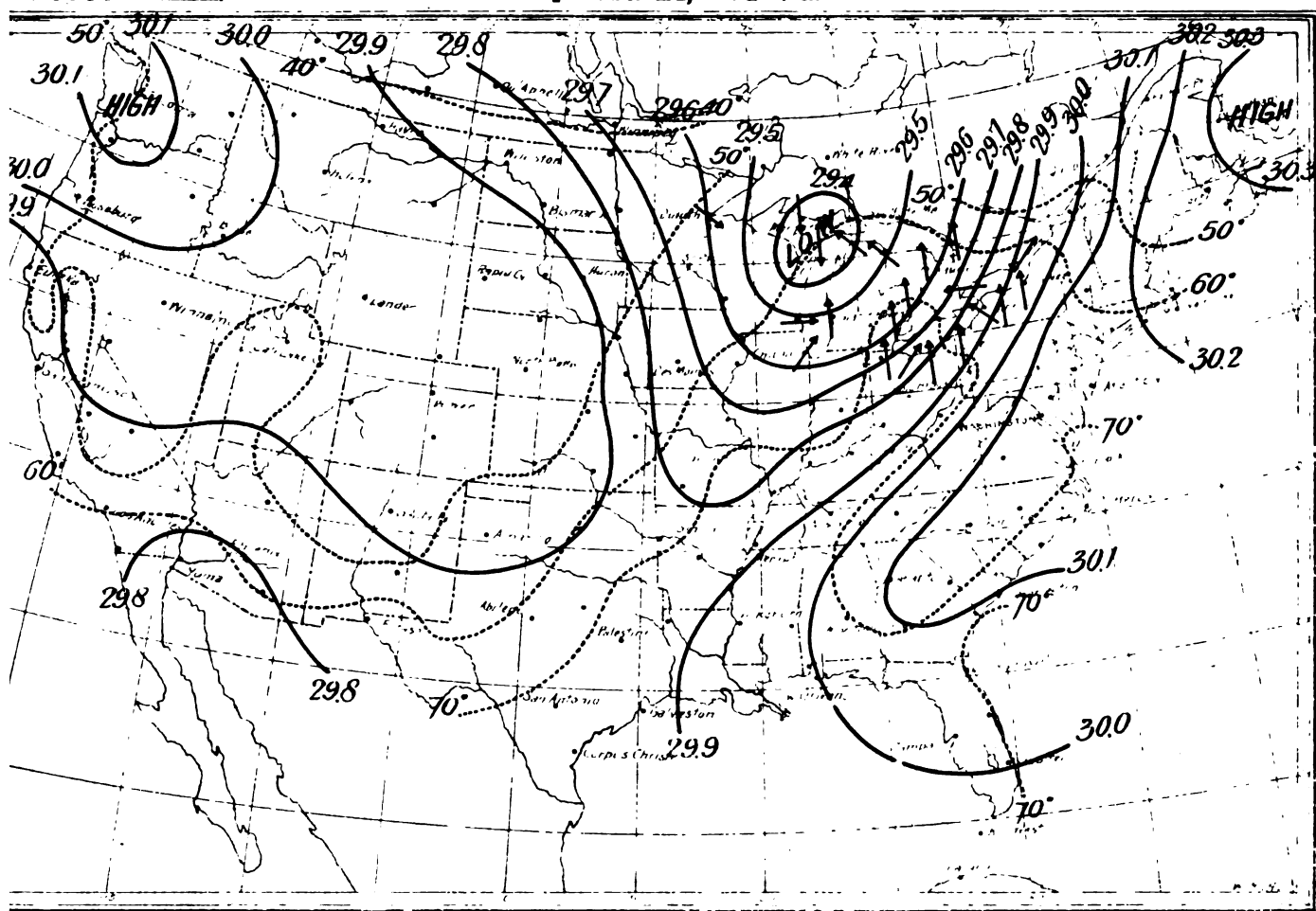


Chart 0000LXXXII.

September 28, 1884—3 p. m.



September 24, 1884—7 a. m.



September 24, 1884—8 p. m.

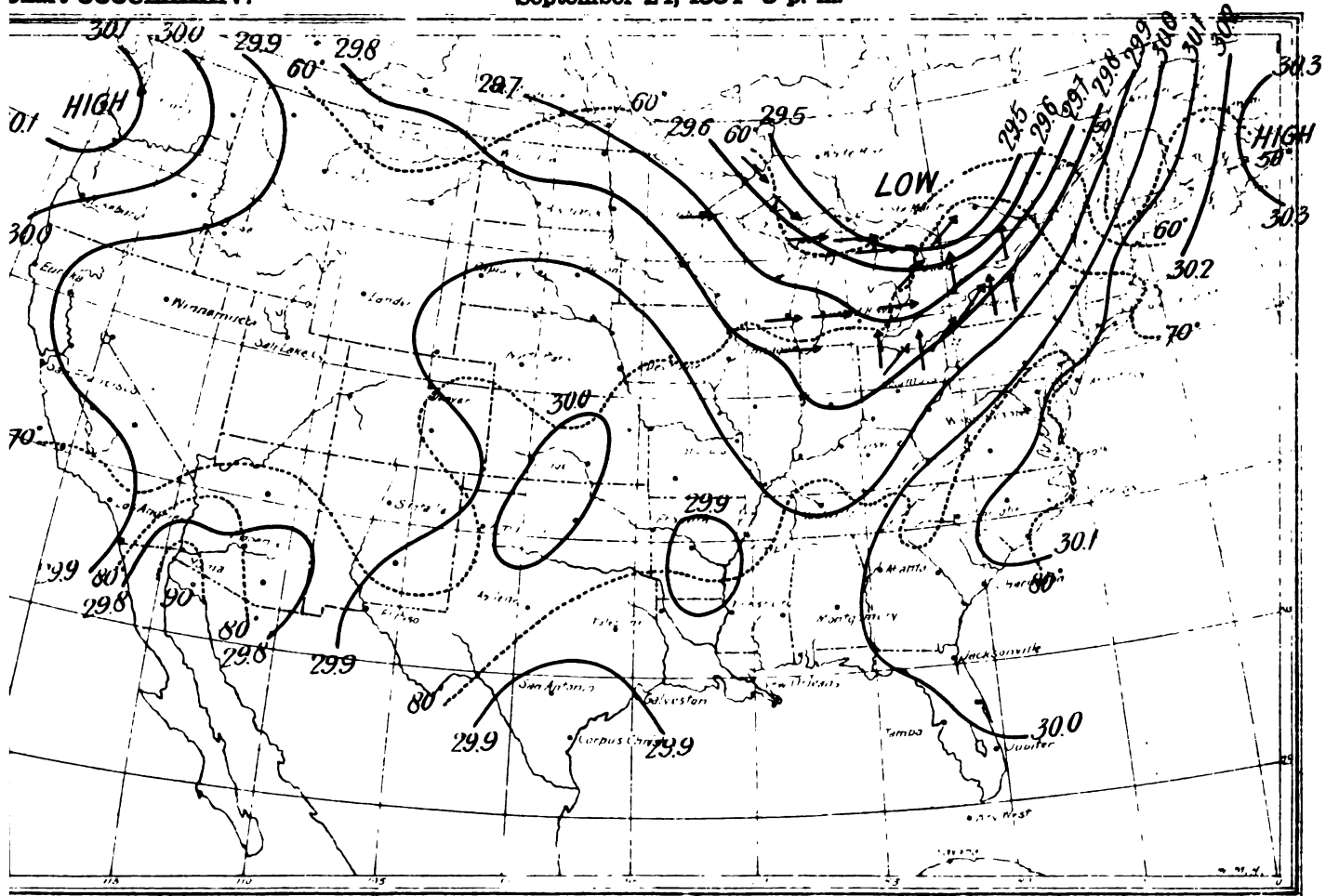


Chart 0000LXXXV.

September 7, 1885—7 a. m.

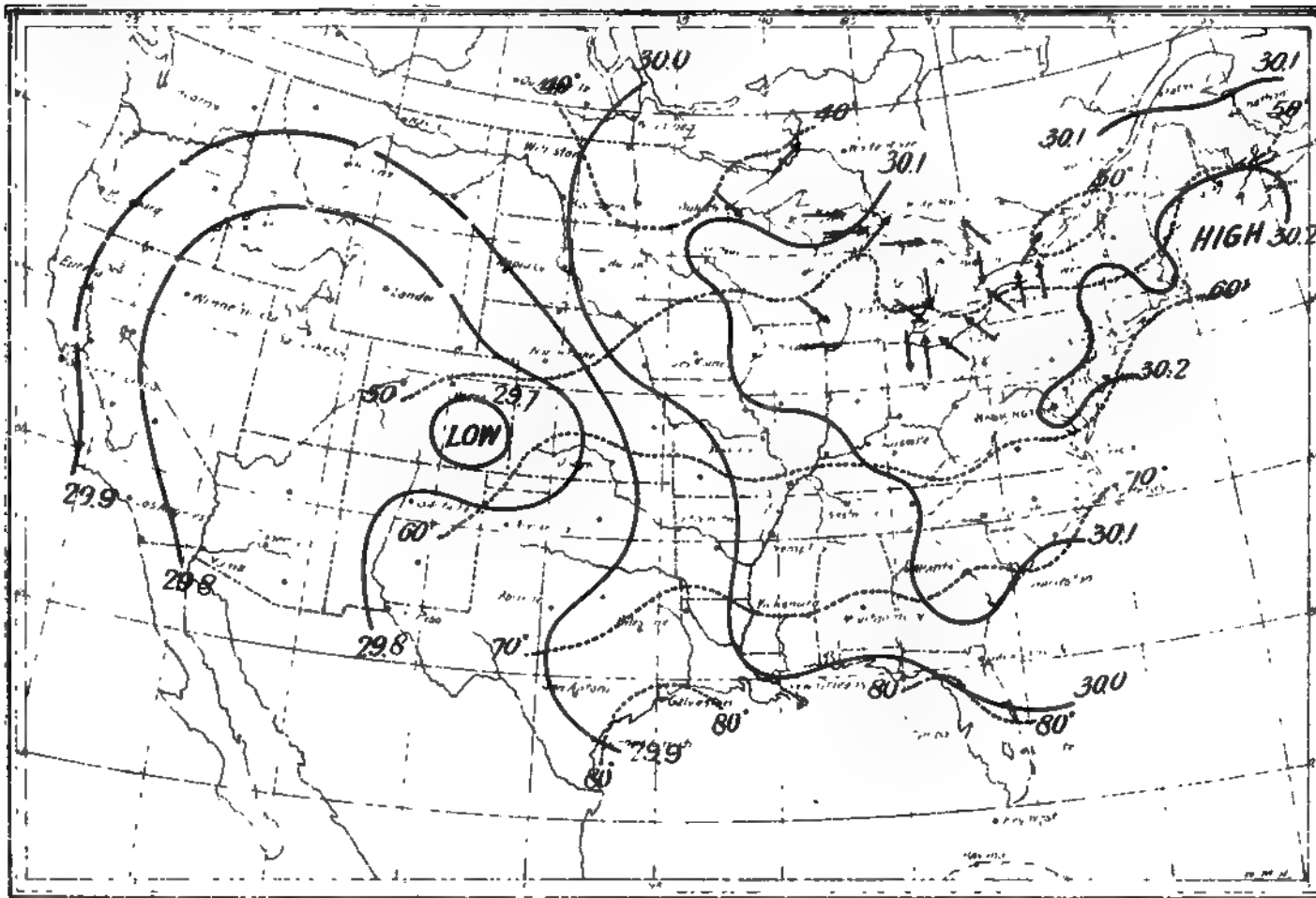


Chart 0000LXXXVI.

September 7, 1885—3 p. m.

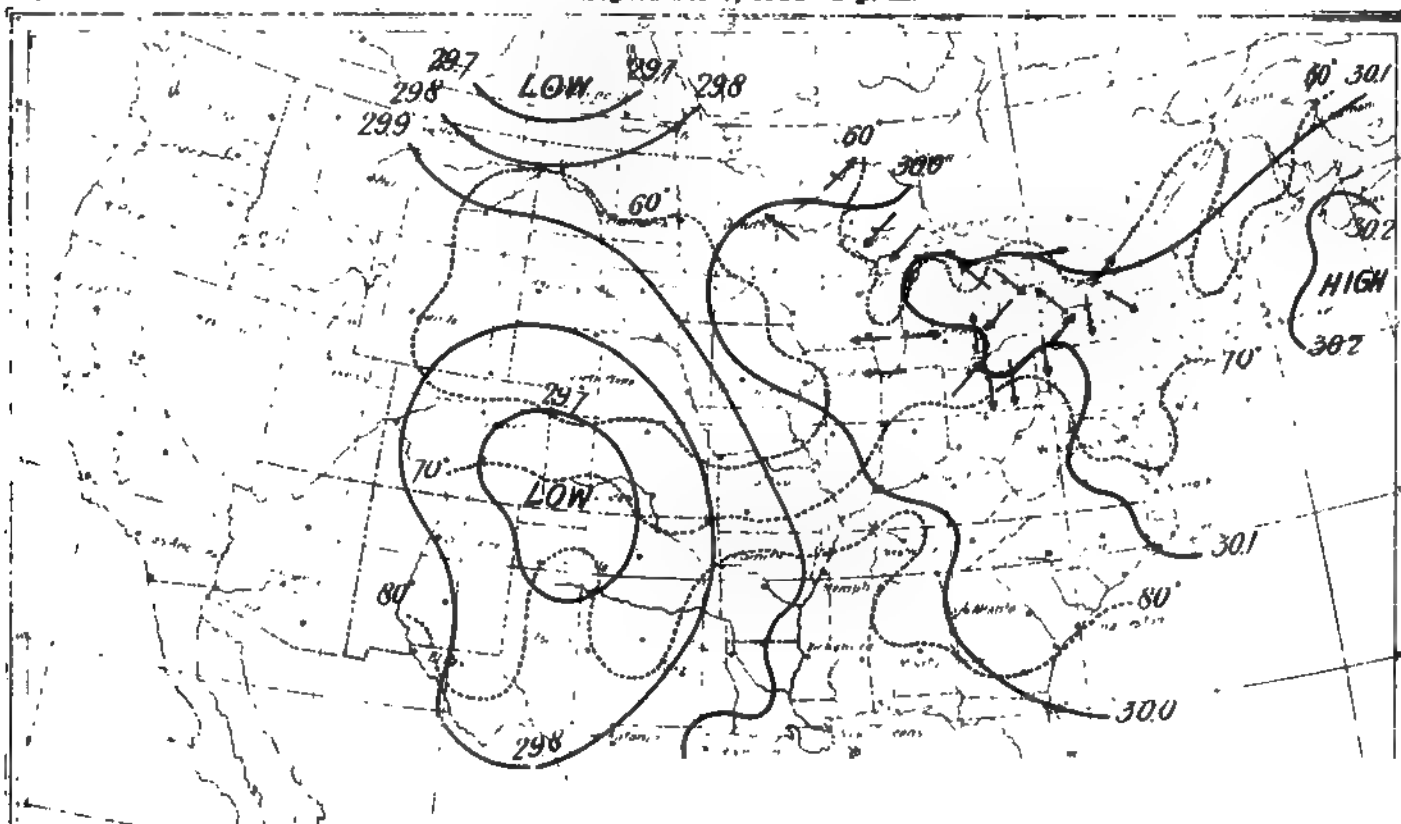


Chart 0000LXXXVII.

September 8, 1885—7 a. m.

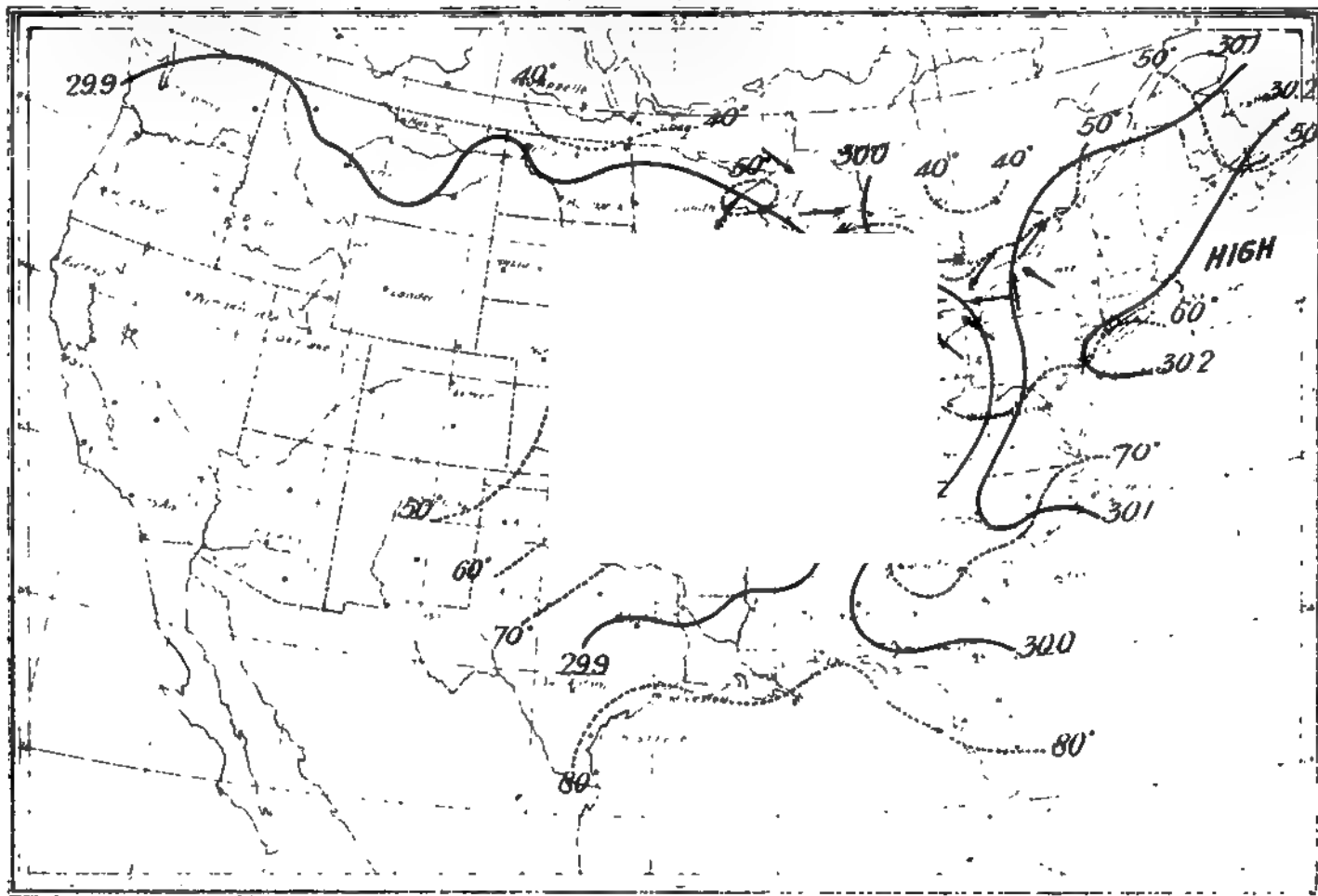
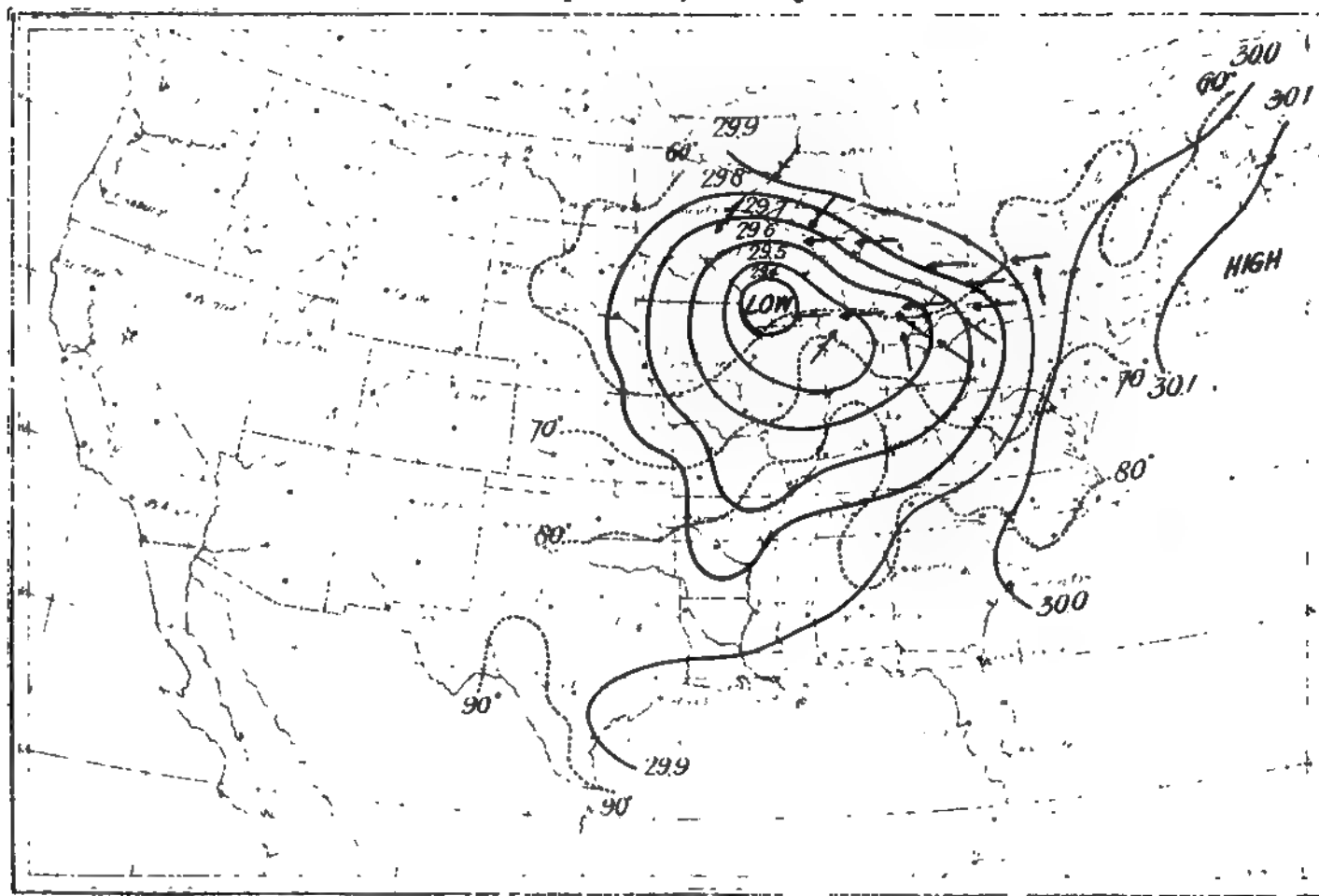


Chart 0000LXXXVIII.

September 8, 1885—3 p. m.



September 25, 1888—8 a. m.

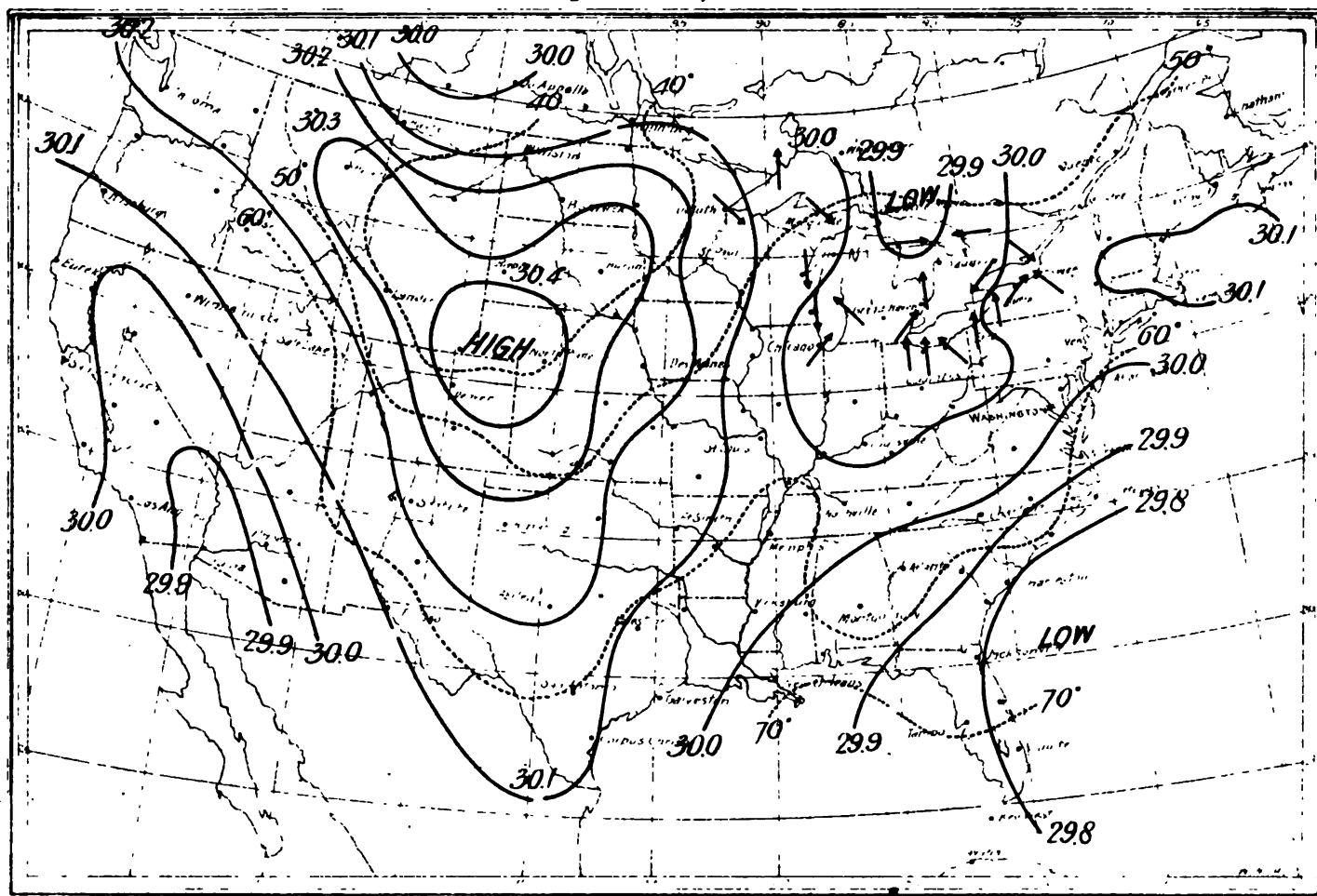
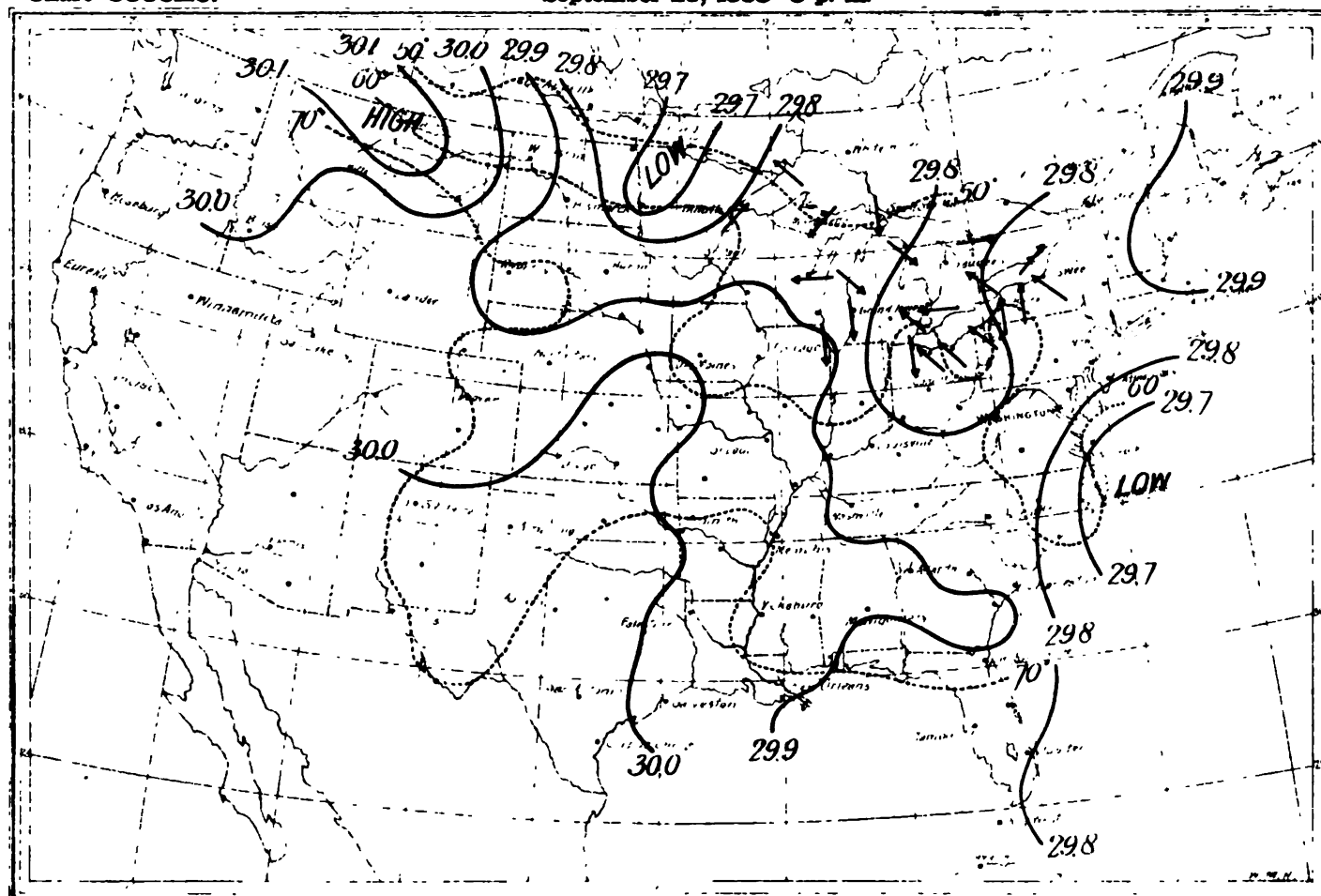


Chart 0000XO.

September 25, 1888—8 p. m.



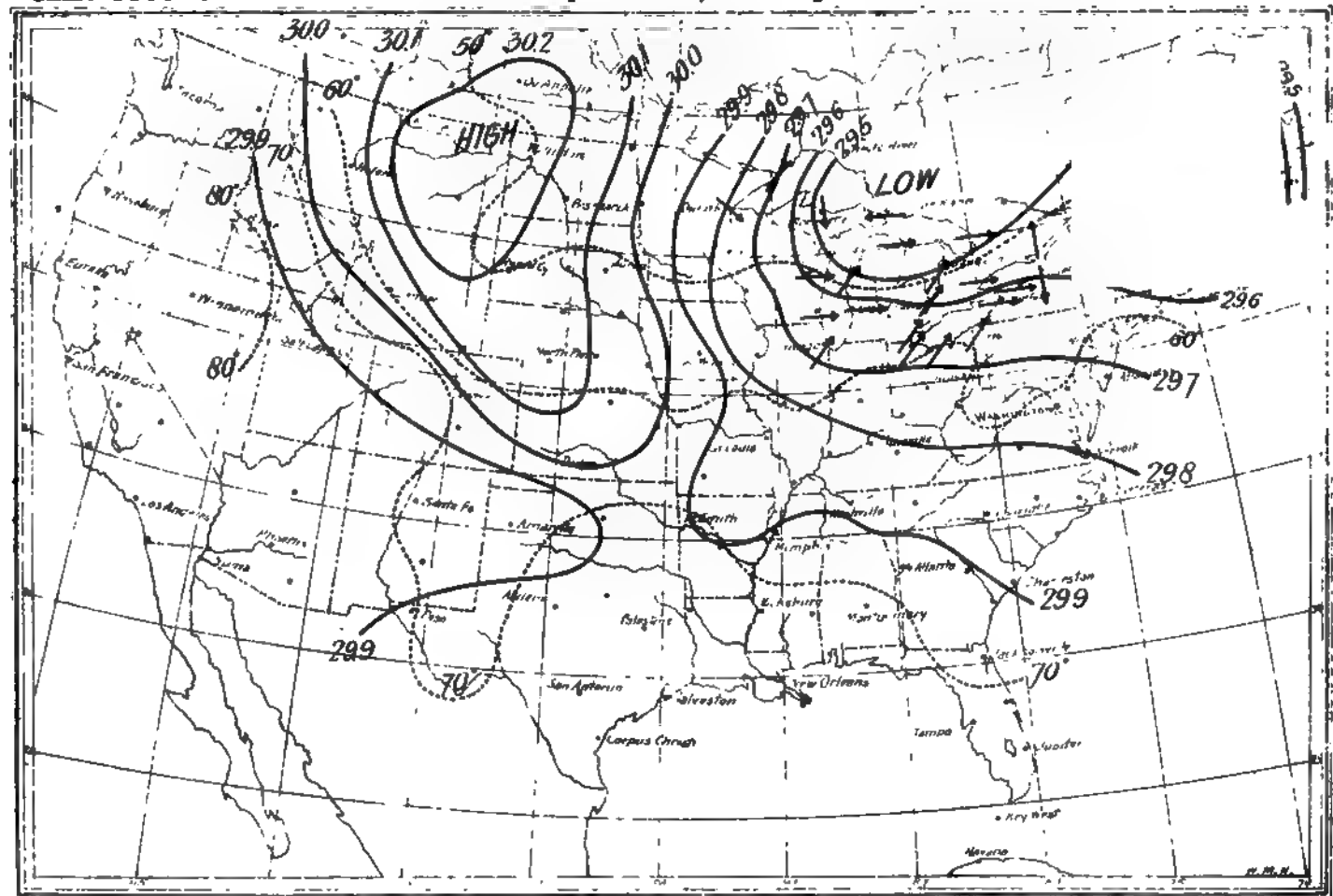
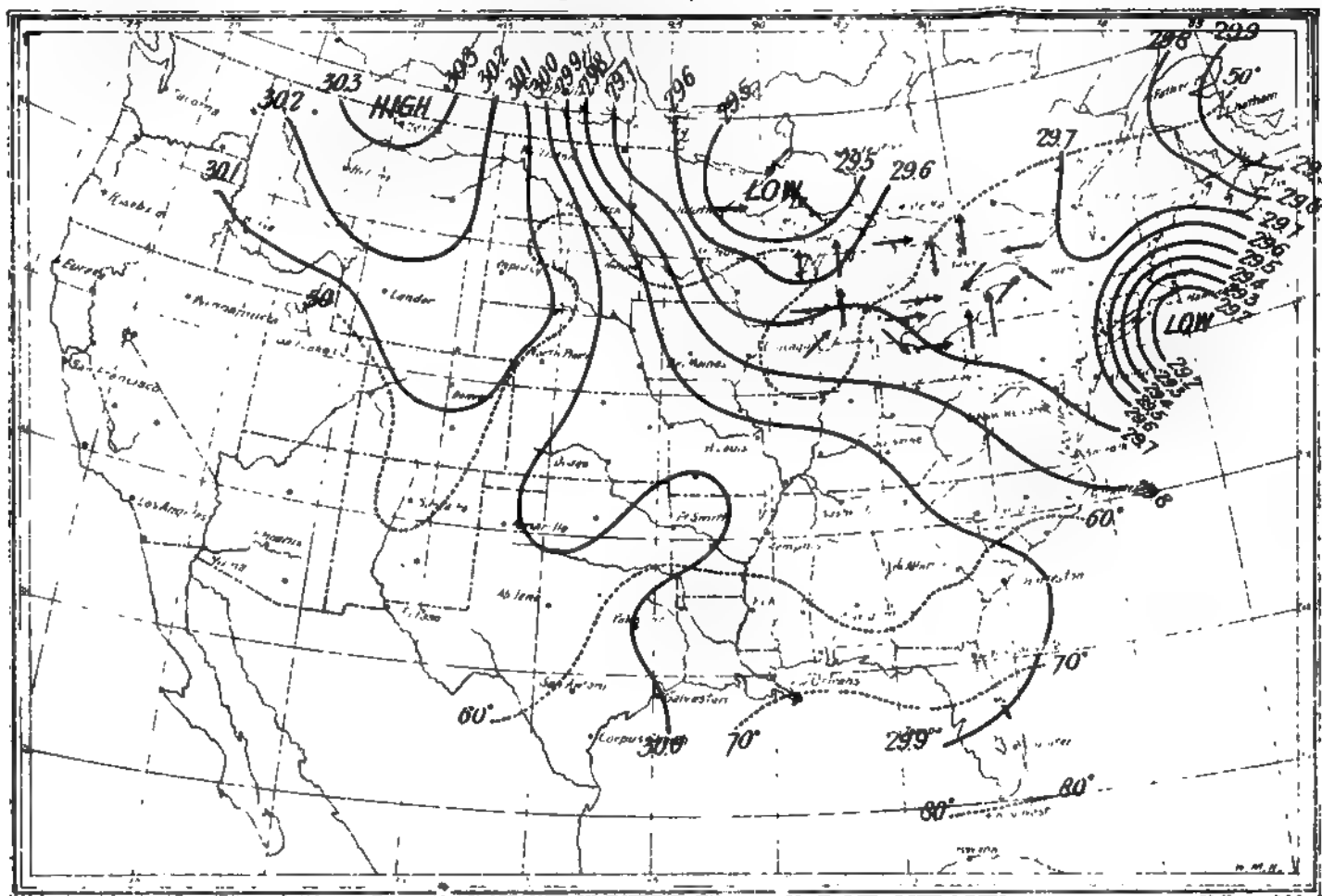


Chart OOOOXXIII.

September 18, 1889—8 a. m.

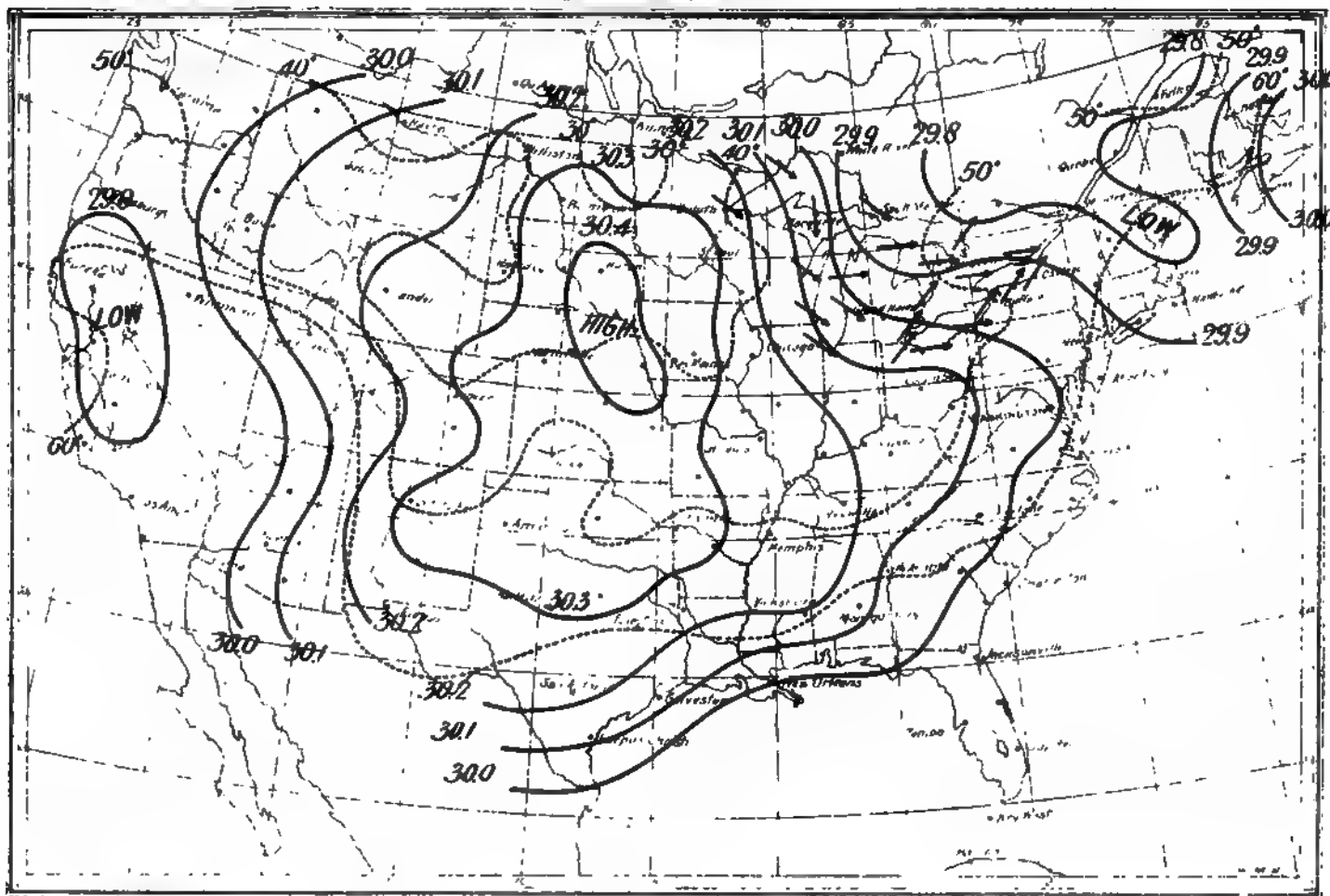


Chart OOOOXXIV.

September 18, 1889—8 p. m.

Chart OOOOXOV.

September 19, 1889—8 a. m.

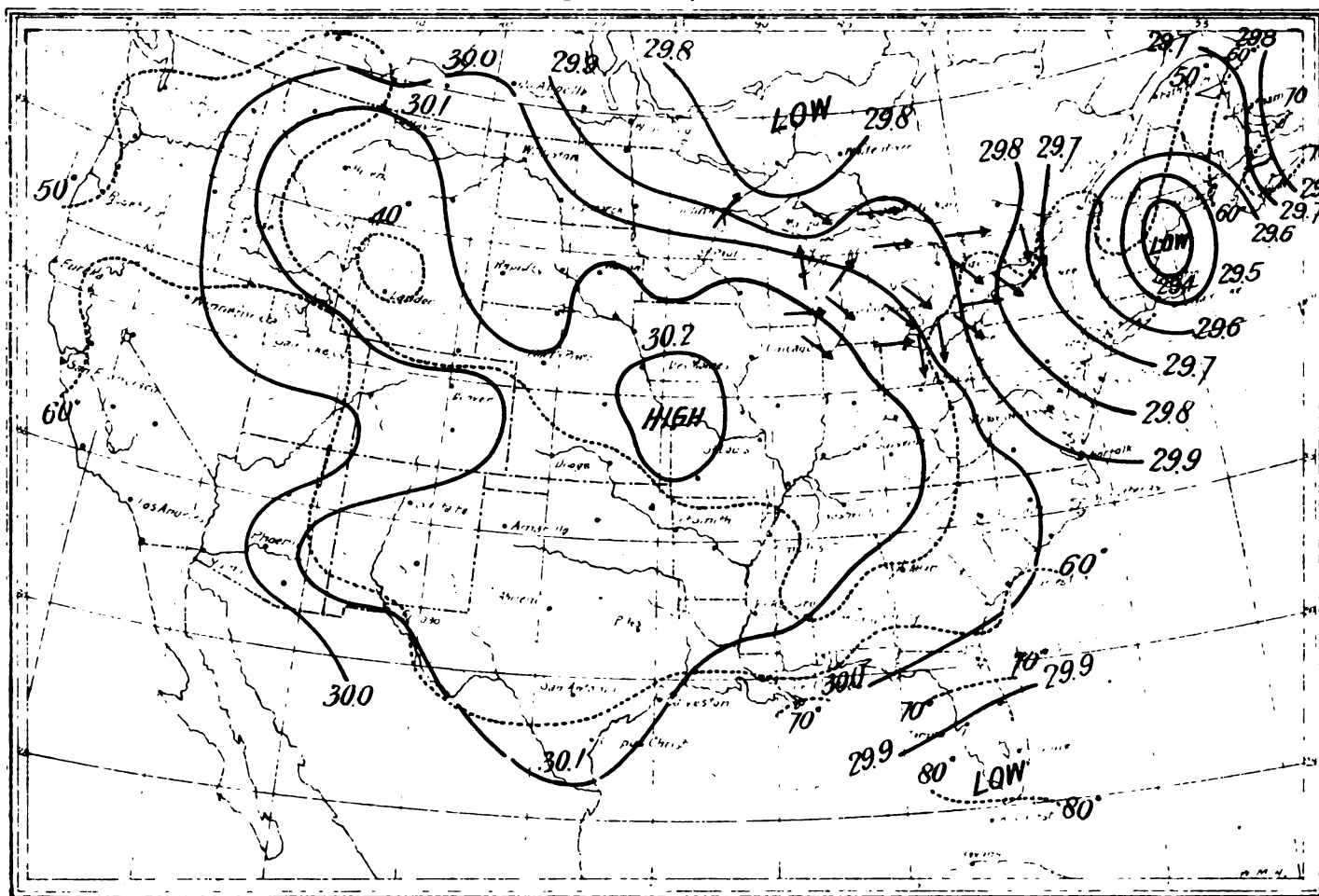


Chart OOOOXOVI.

September 19, 1889—8 p. m.

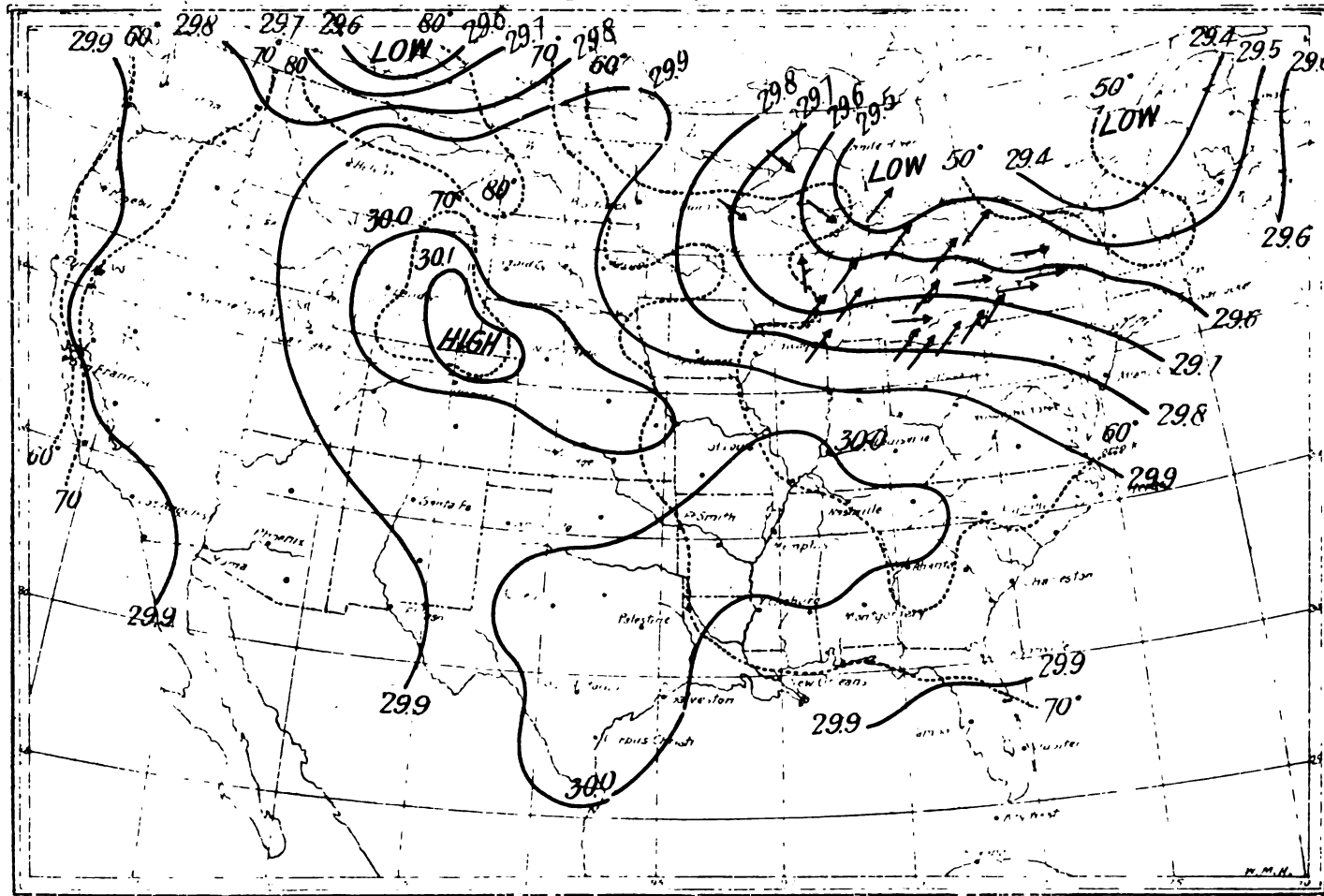


Chart OOOOXOVII.

September 14, 1891—8 a. m.

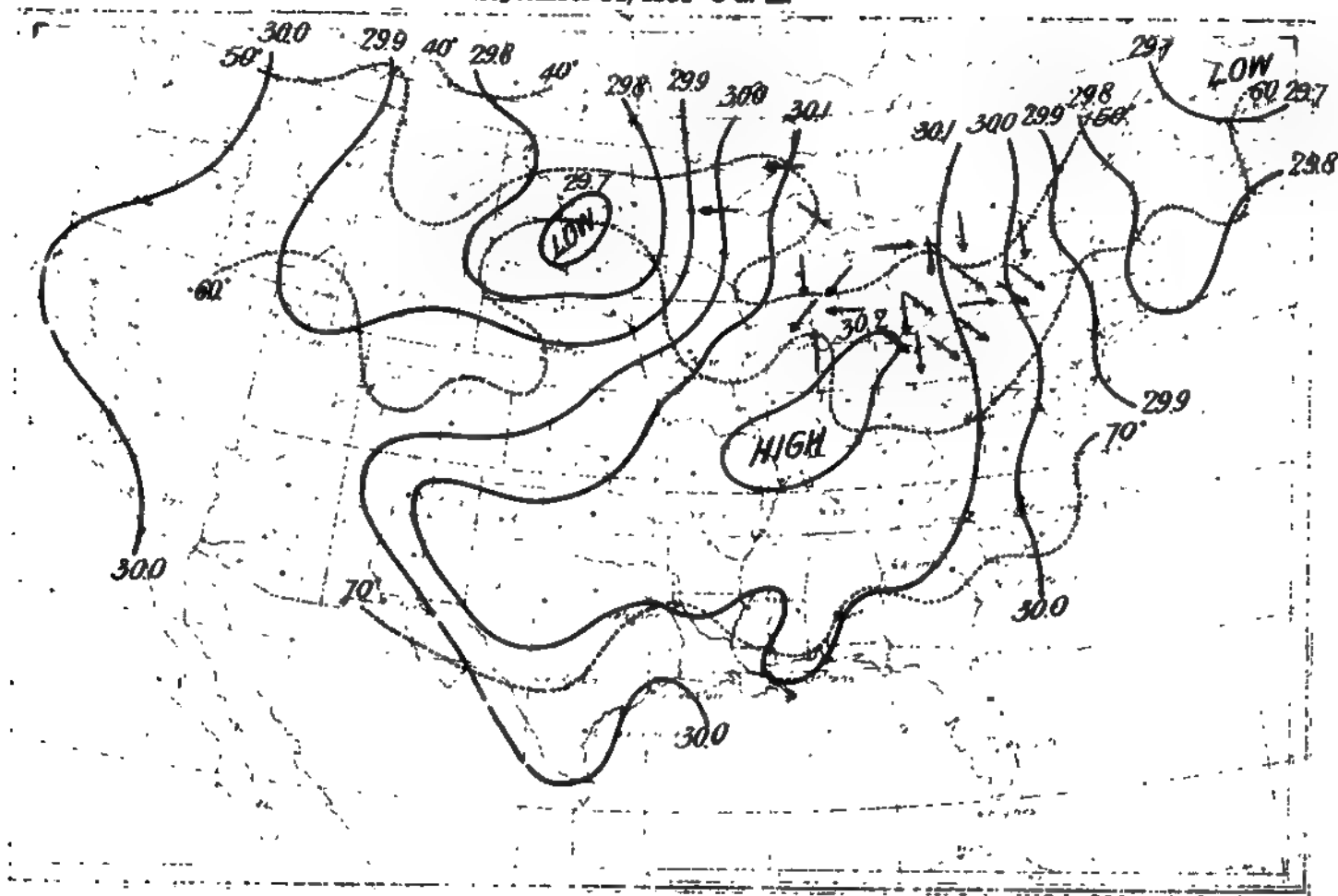


Chart OOOOXOVIII.

September 14, 1891—8 p. m.



Chart CCCCXIX.

September 15, 1891—8 a. m.

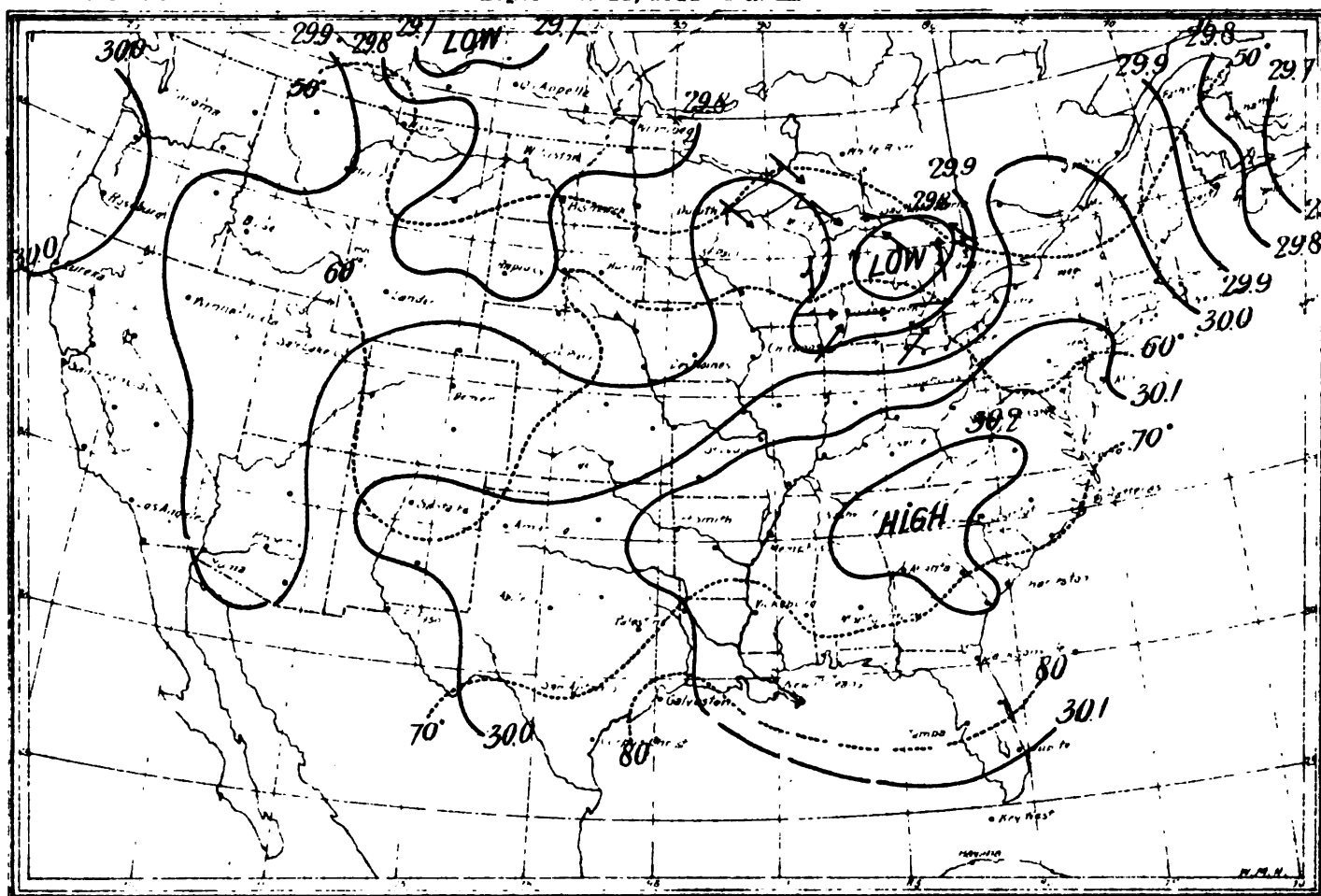


Chart D.

September 15, 1891—8 p. m.

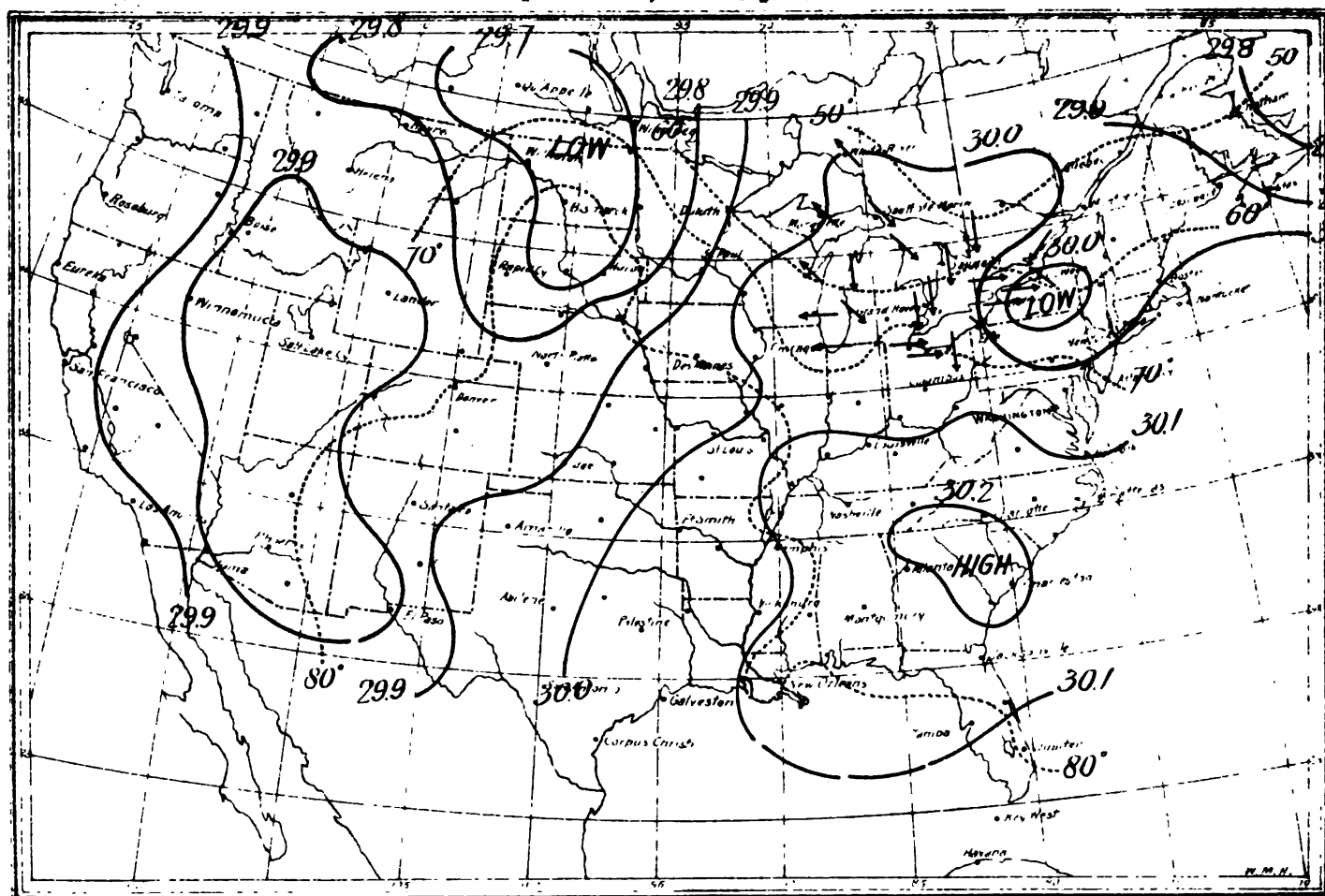


Chart DI.

September 27, 1891—8 a. m.

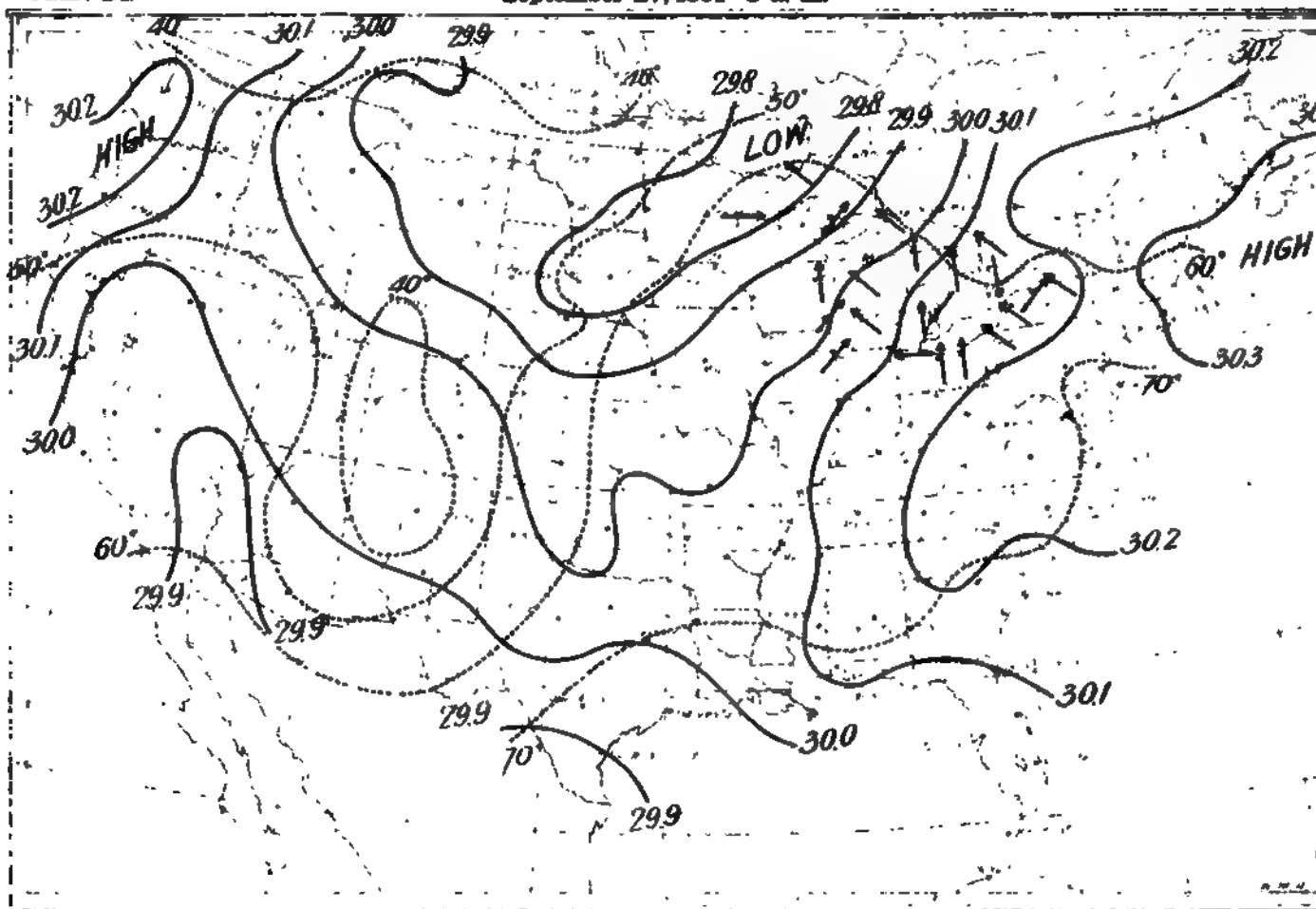
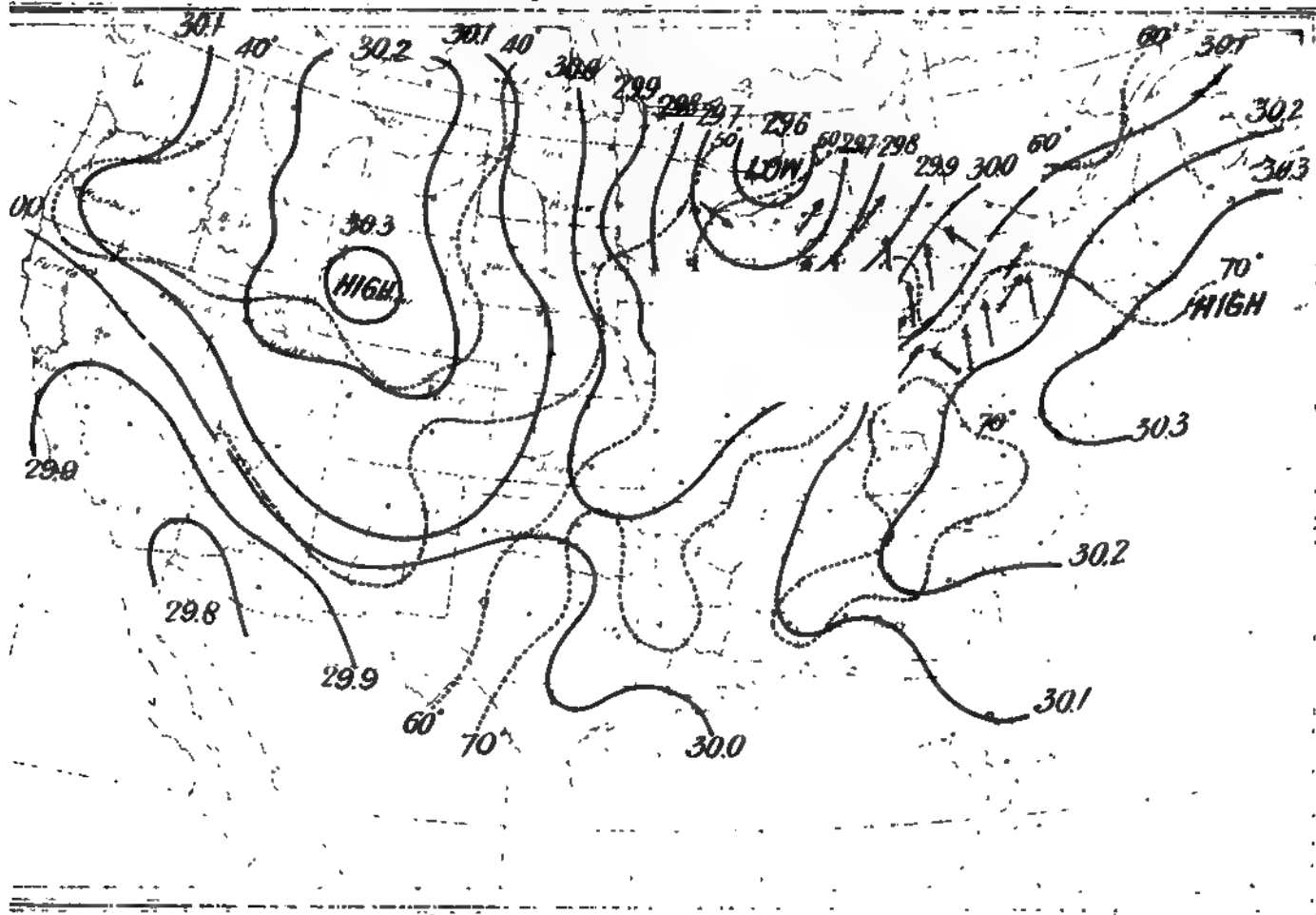


Chart DII.

September 27, 1891—8 p. m.

September 28, 1891—8 a. m.



September 28, 1891—8 p. m.

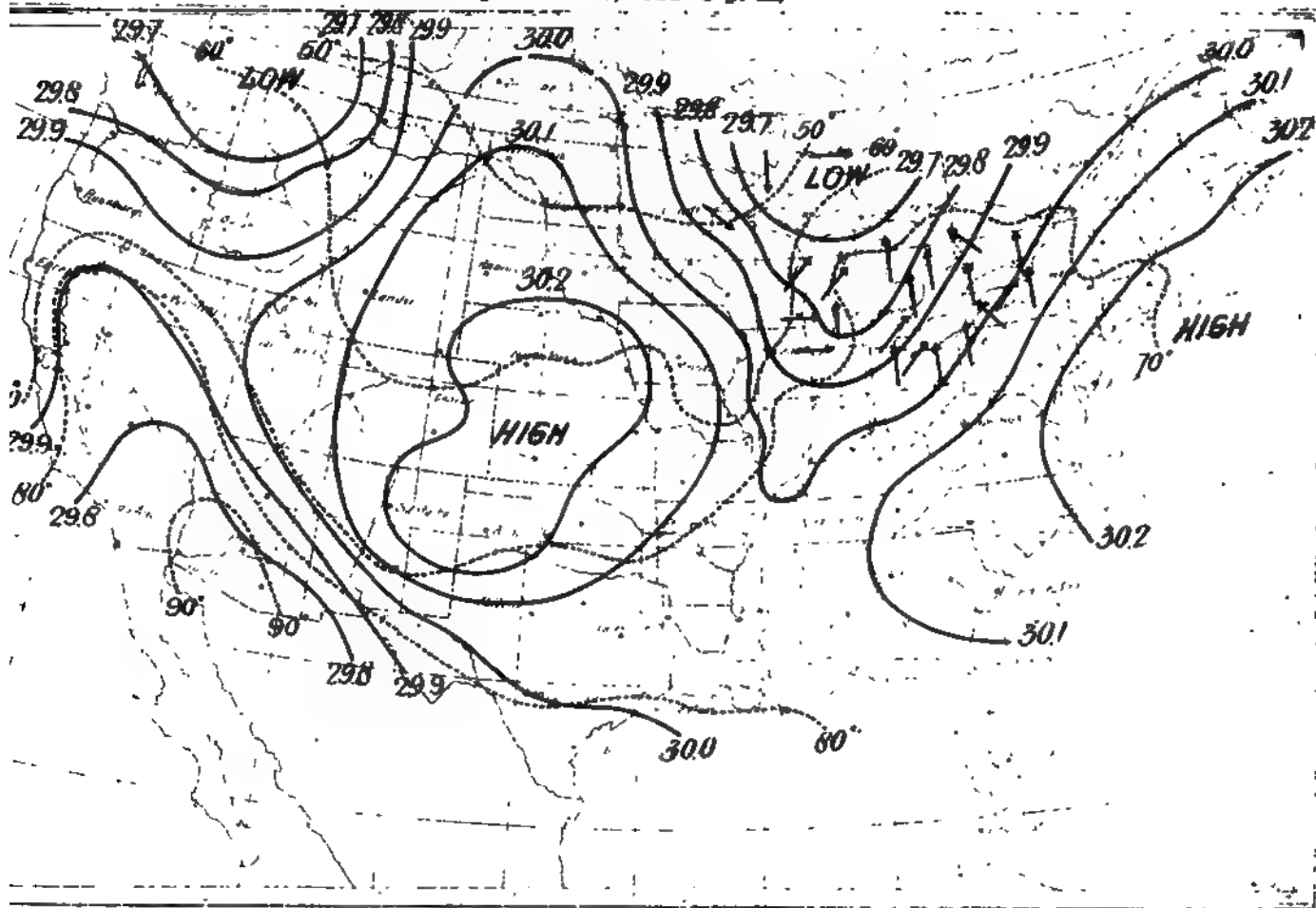


Chart DV.

September 13, 1892—8 a. m.

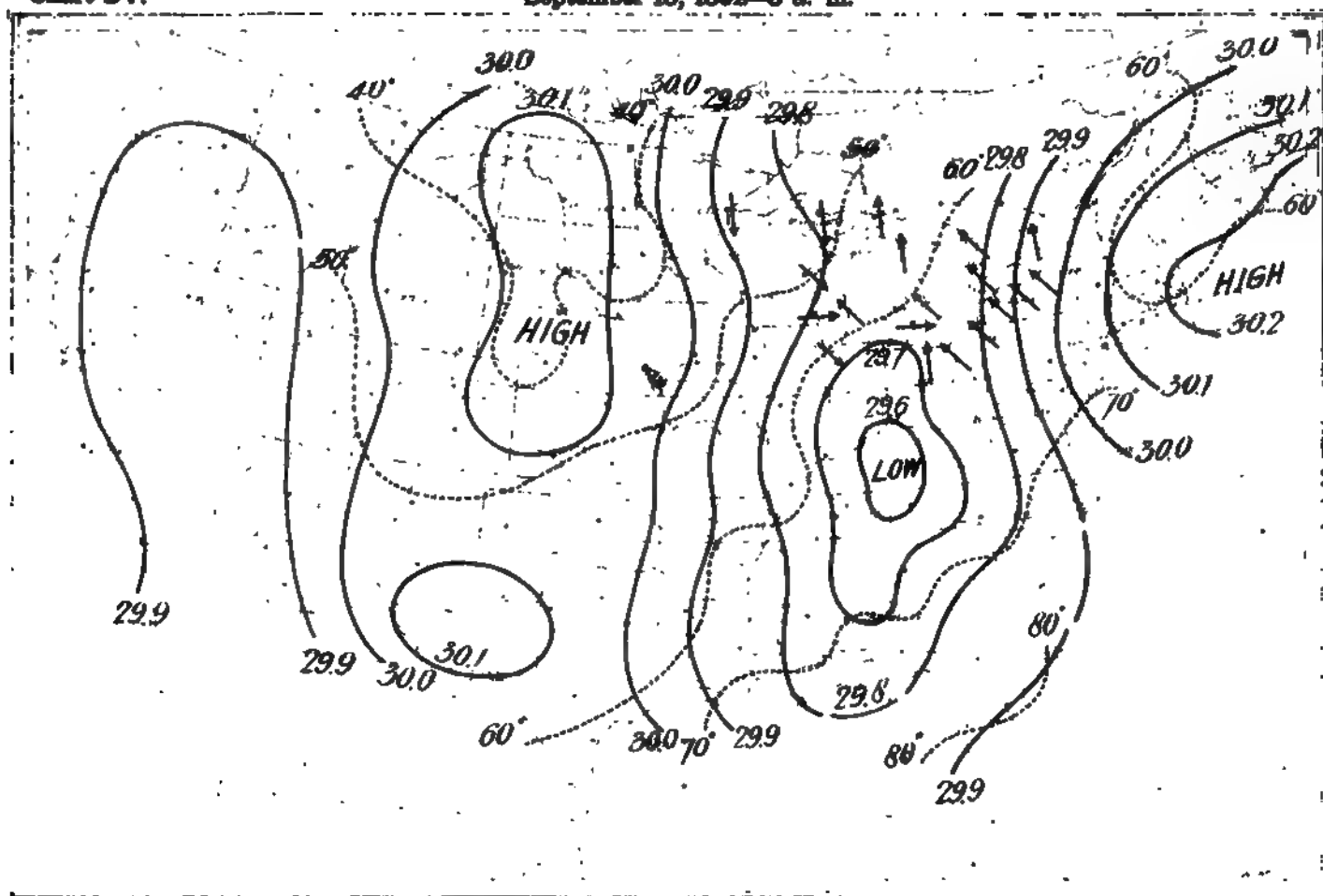


Chart DVL

September 13, 1892—8 p. m.

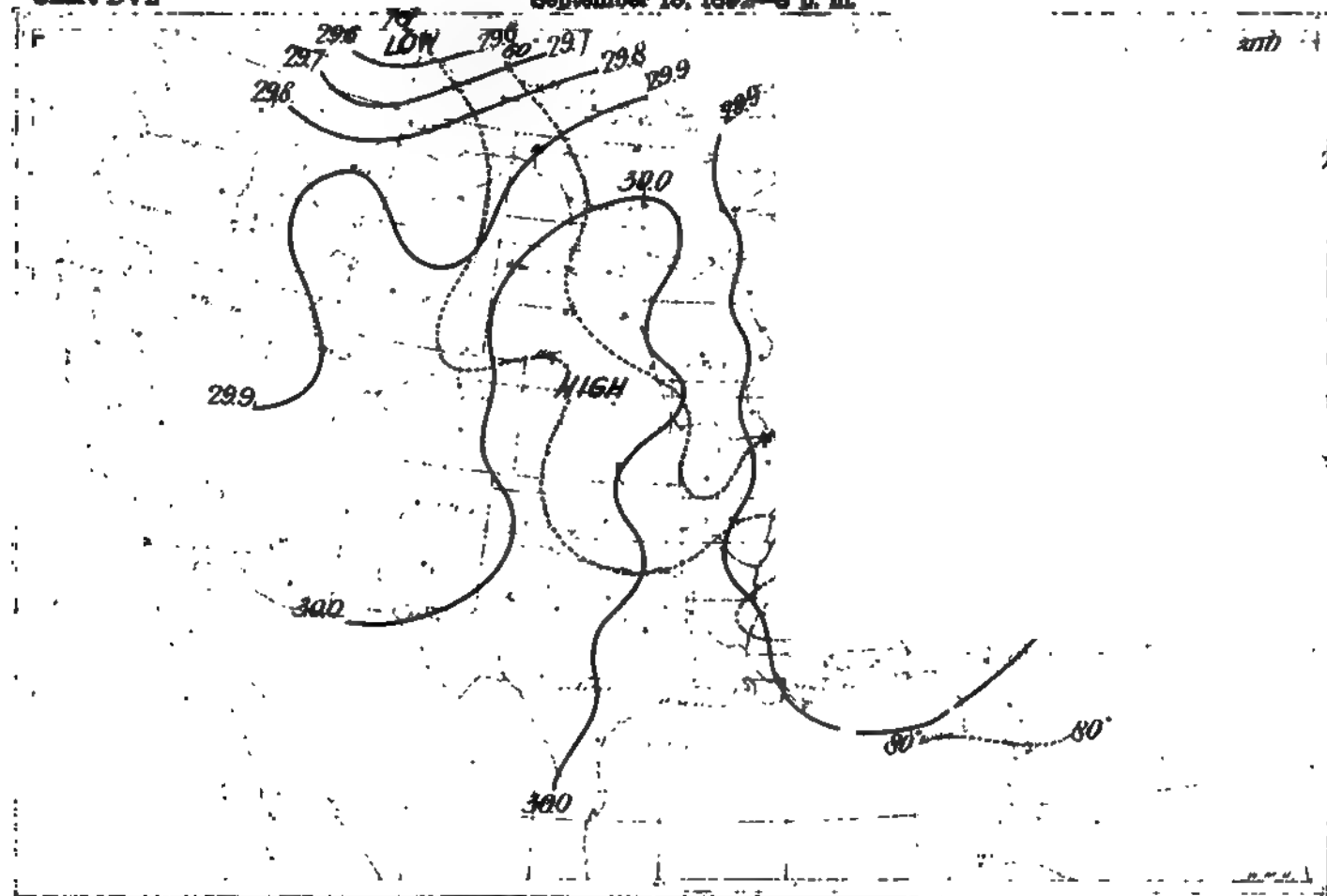


Chart DVII.

September 14, 1892—8 a. m.

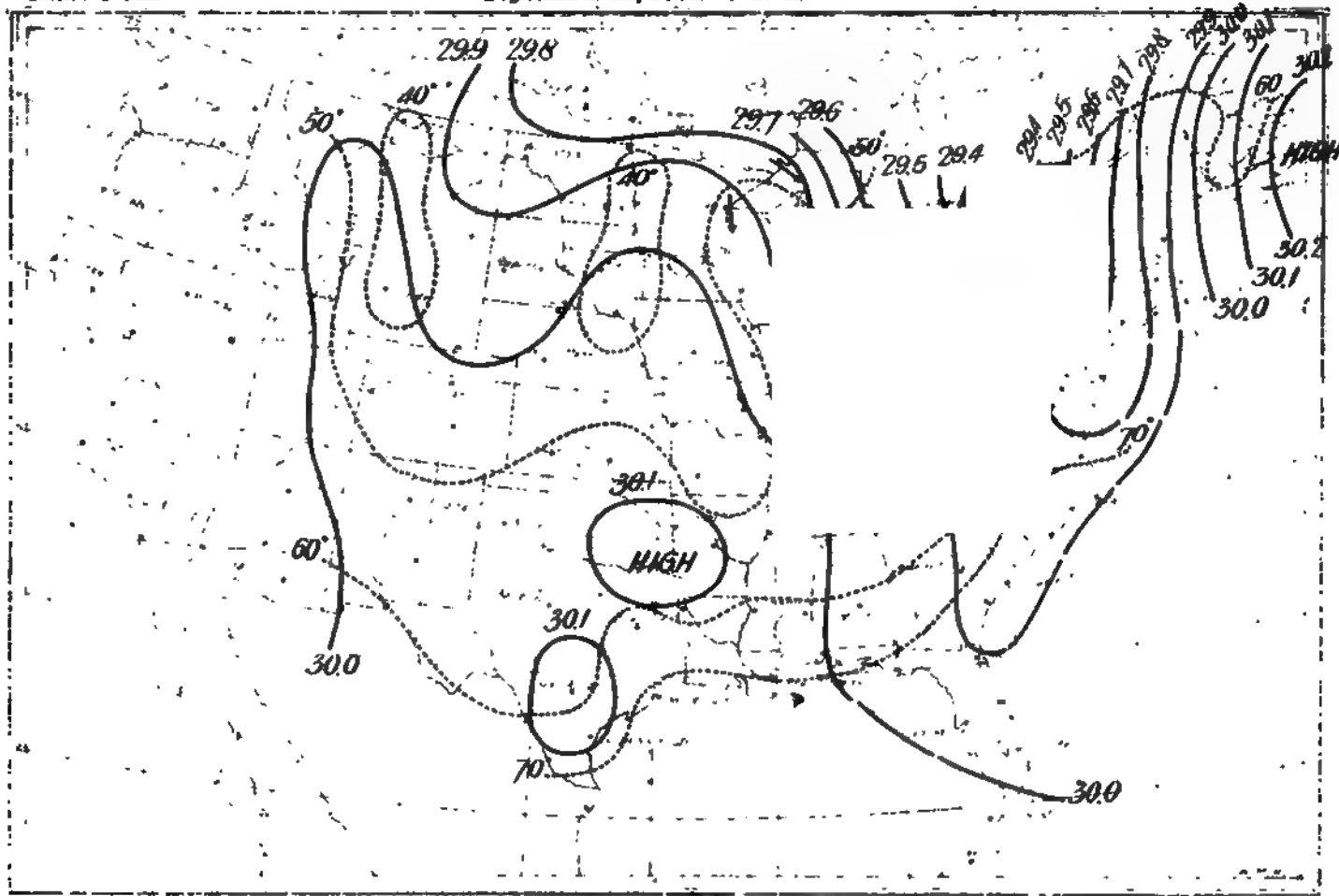


Chart DVIII.

September 14, 1892—8 p. m.

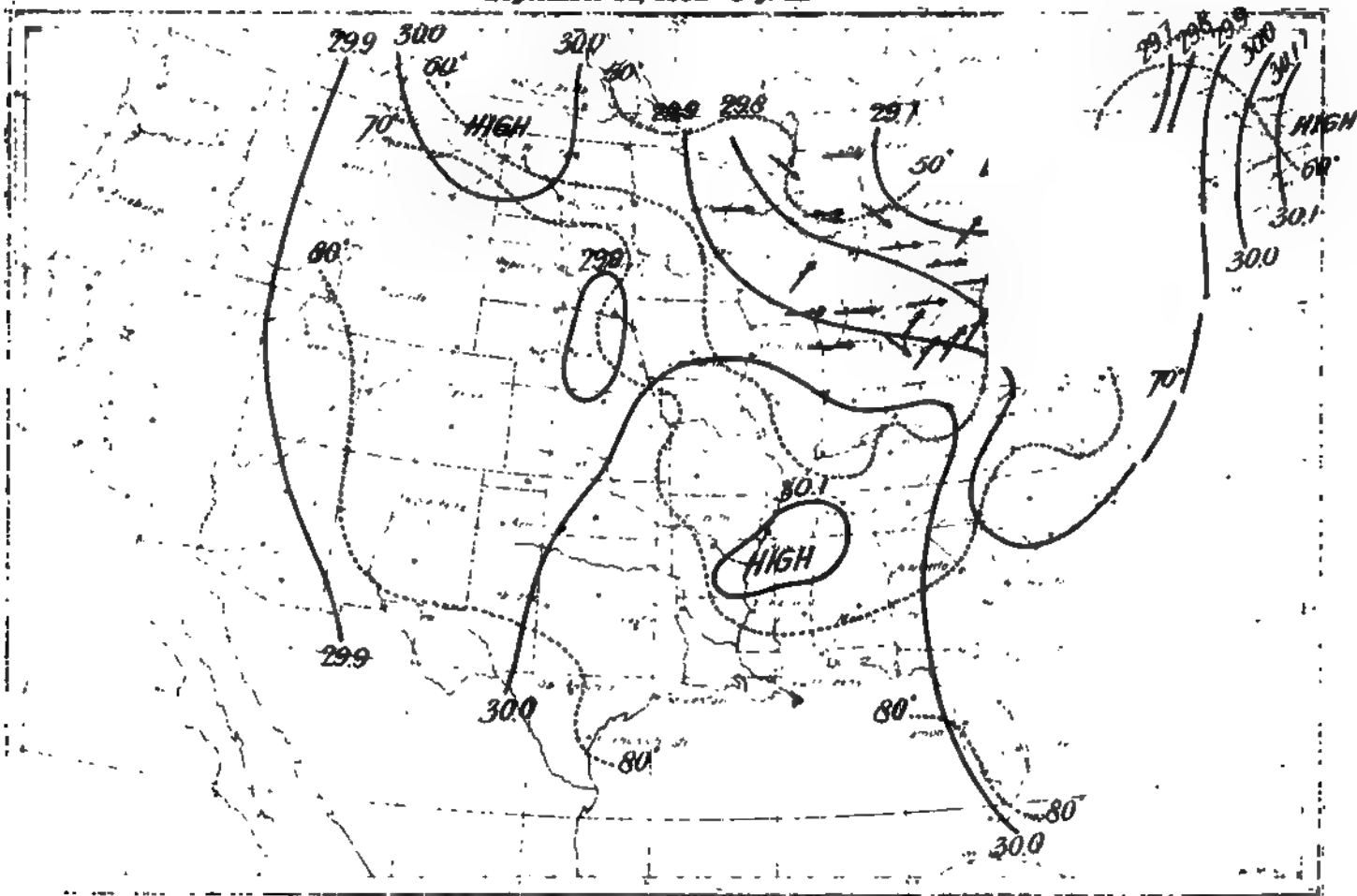


Chart DIX.

September 21, 1894—8 a. m.

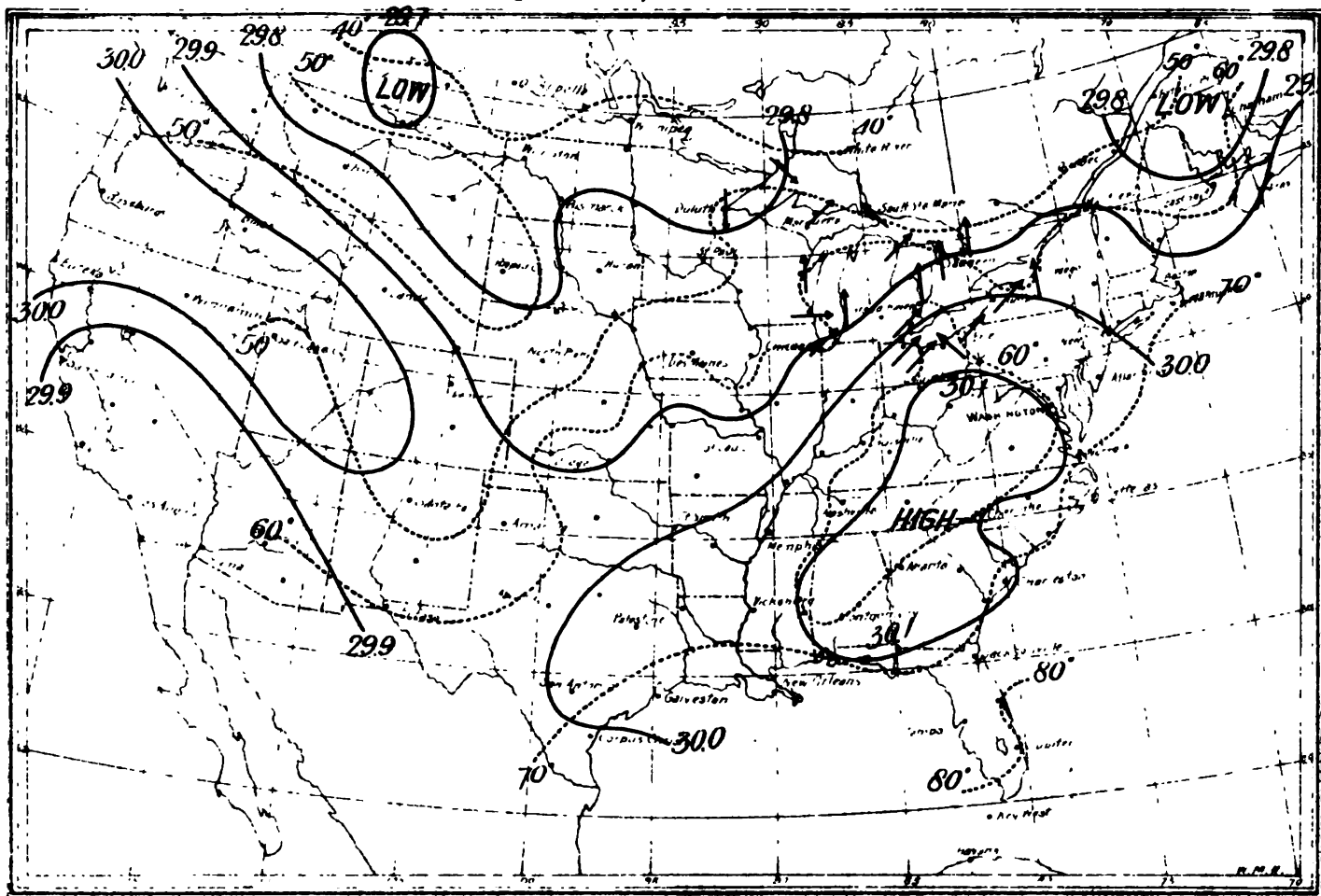


Chart DX.

September 21, 1894—8 p. m.

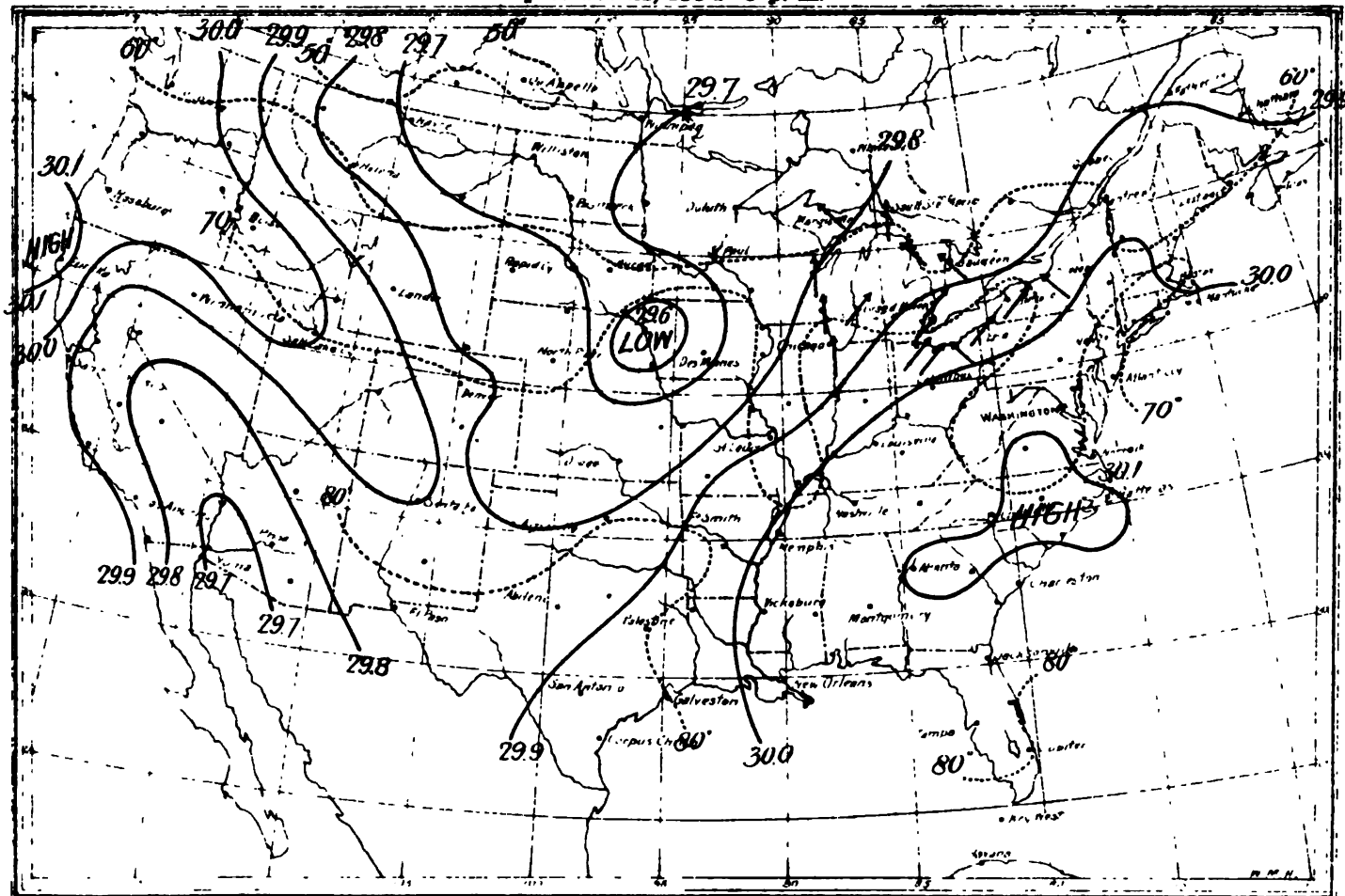


Chart DXI.

September 22, 1904—8 a. m.

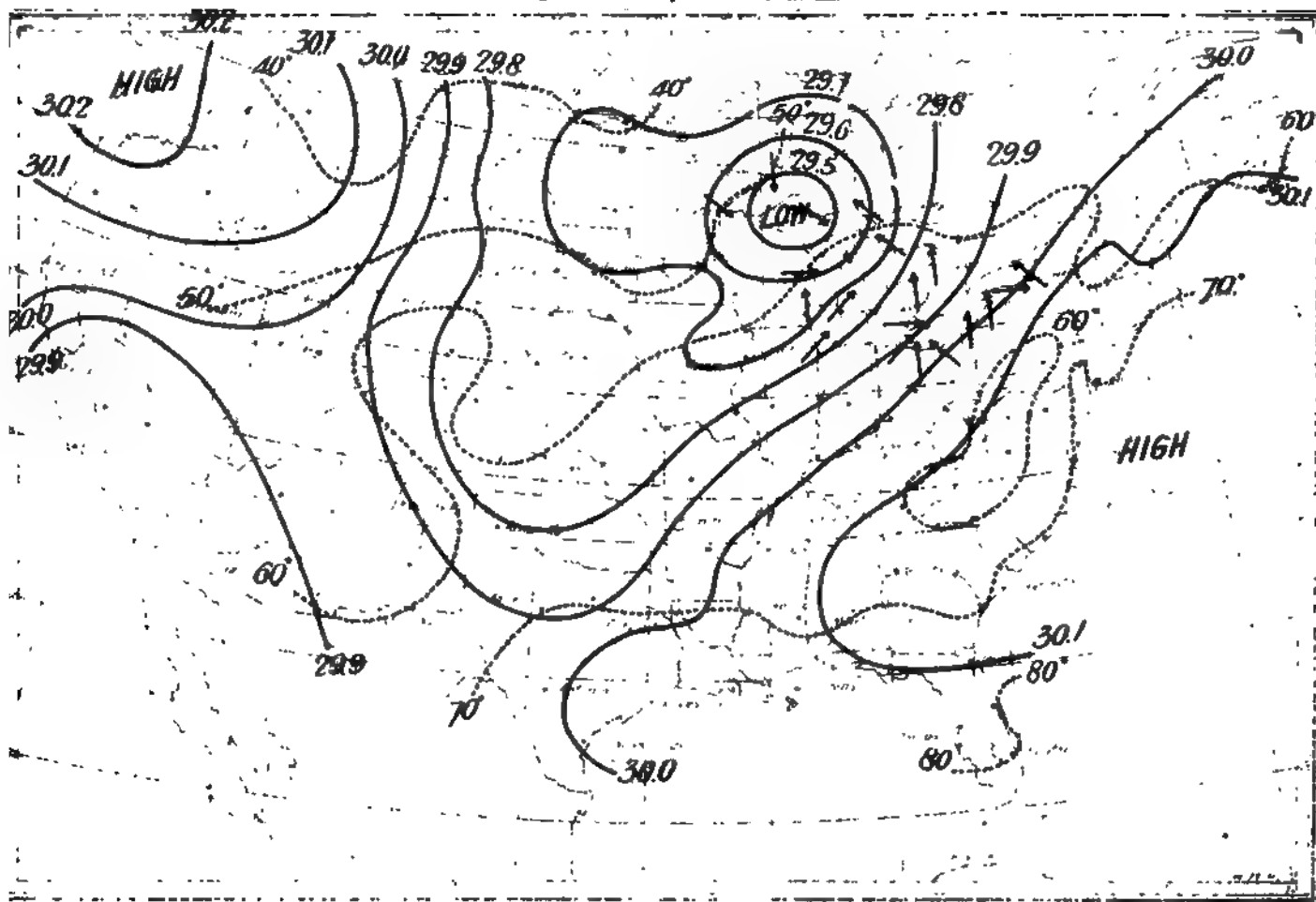


Chart DXII.

September 22, 1904—8 p. m.

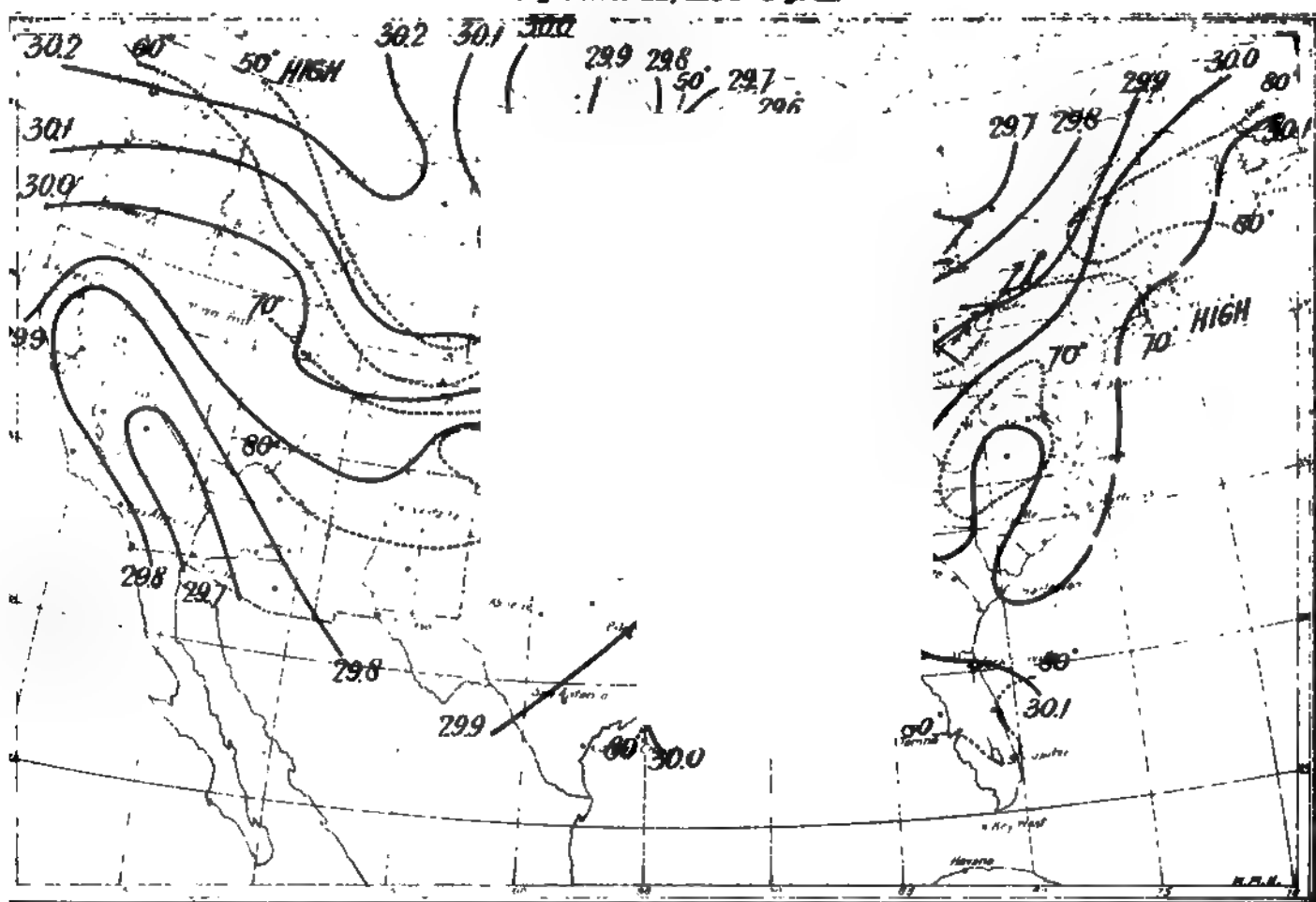


Chart DXIII.

September 27, 1895—8 a. m.

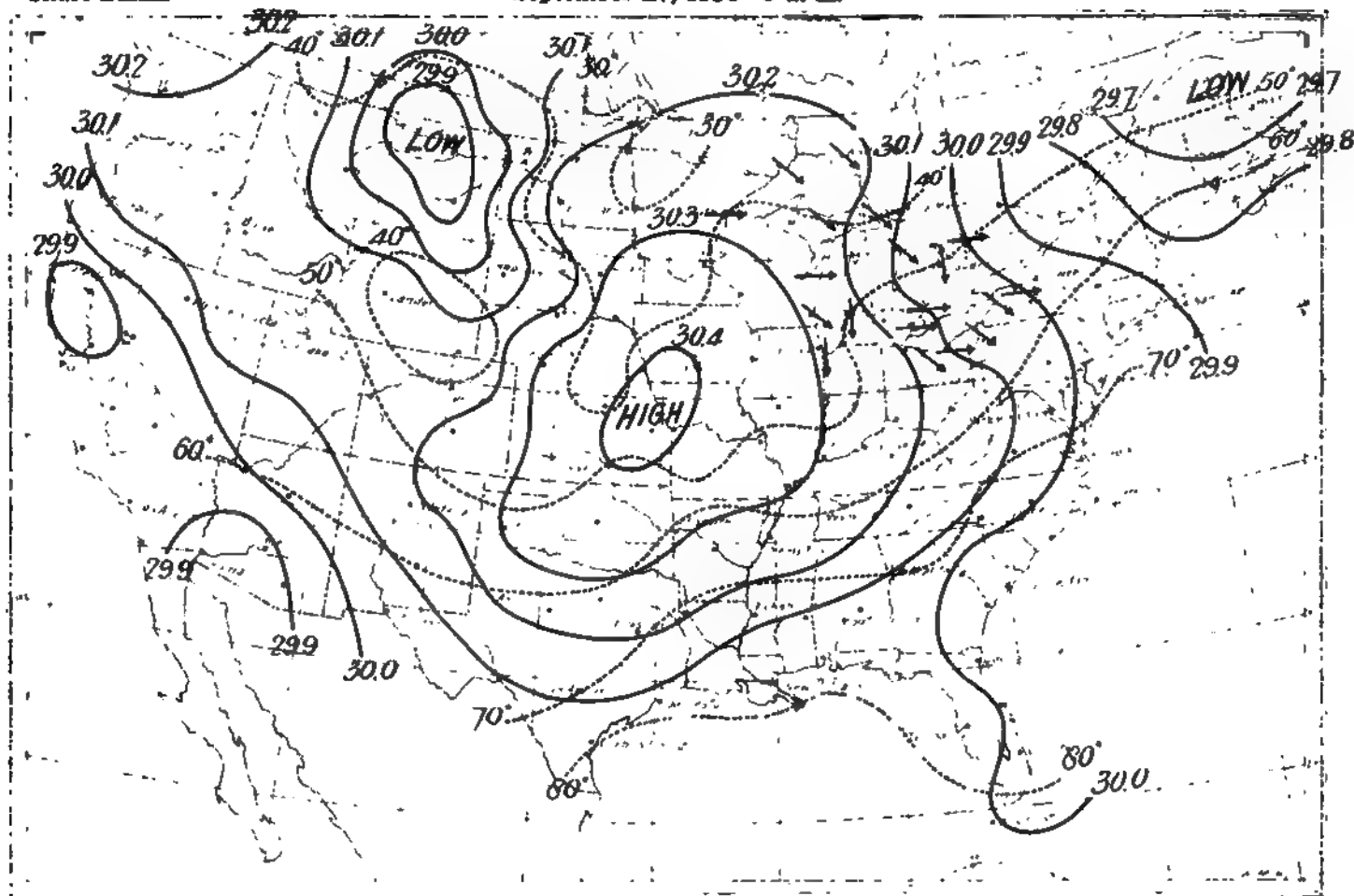


Chart DXIV.

September 27, 1895—8 p. m.

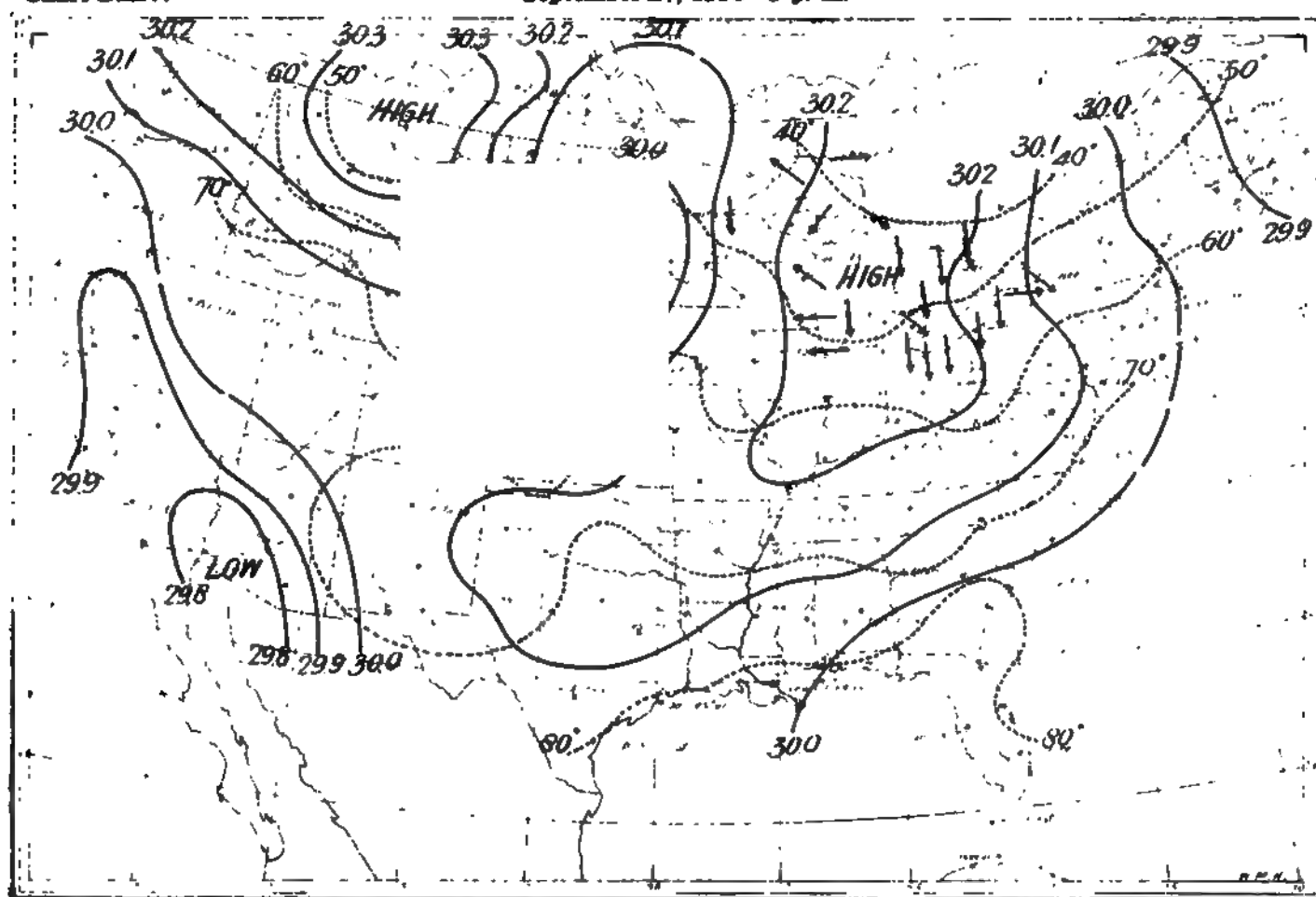


Chart DXV.

September 28, 1895—8 a. m.

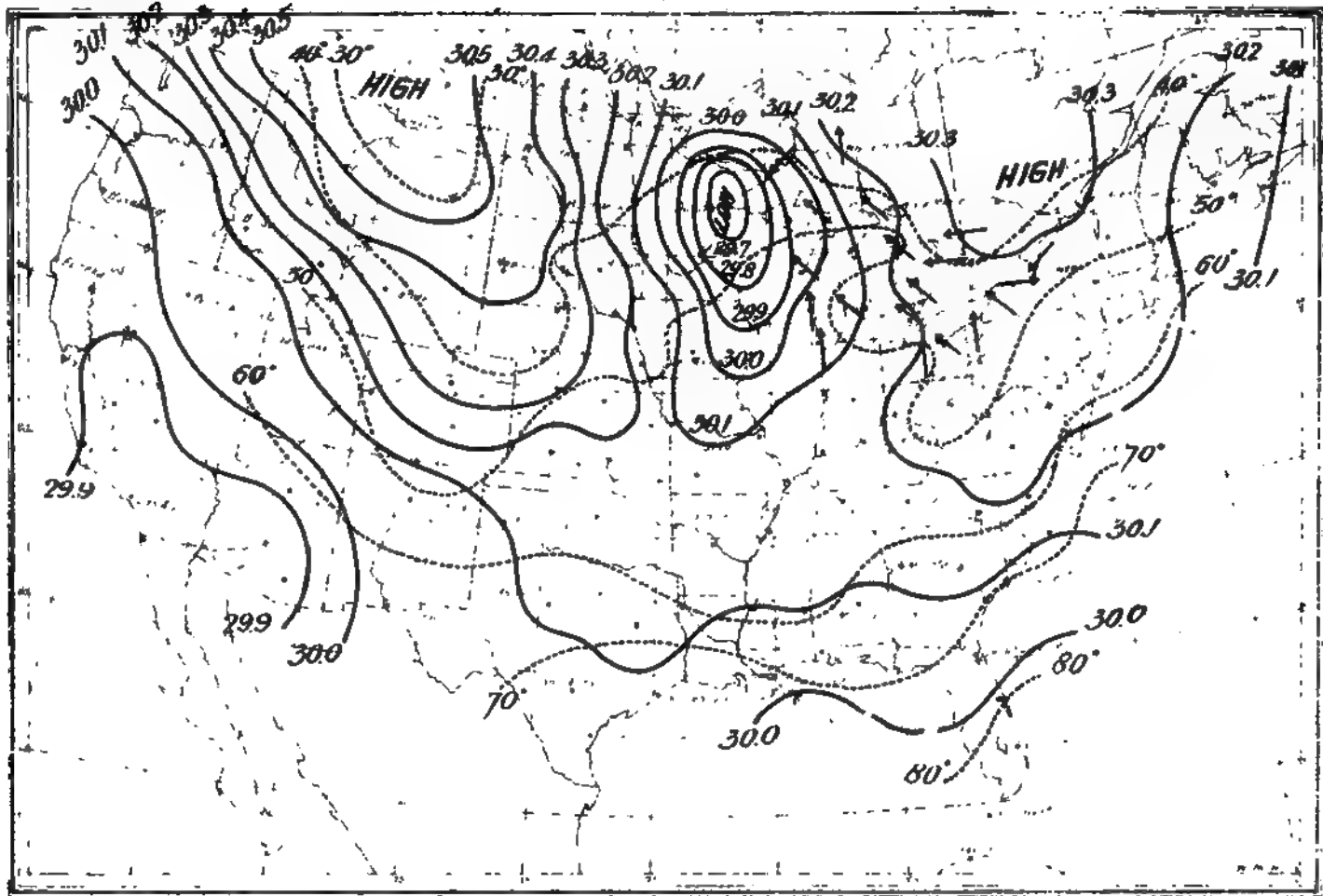


Chart DXVI.

September 28, 1895—8 p. m.

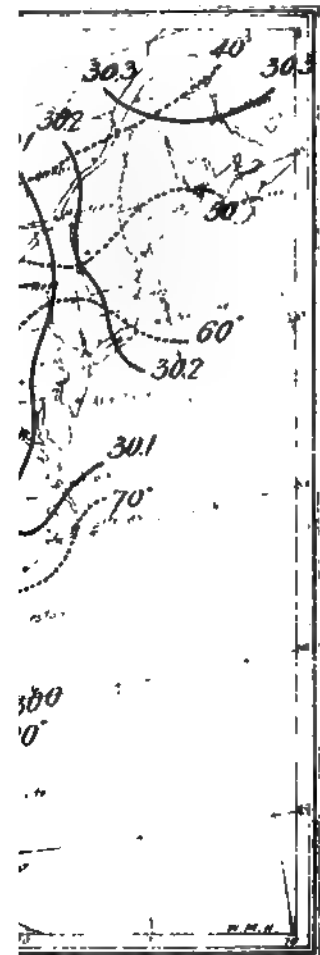


Chart DXVII.

September 20, 1896—8 a. m.

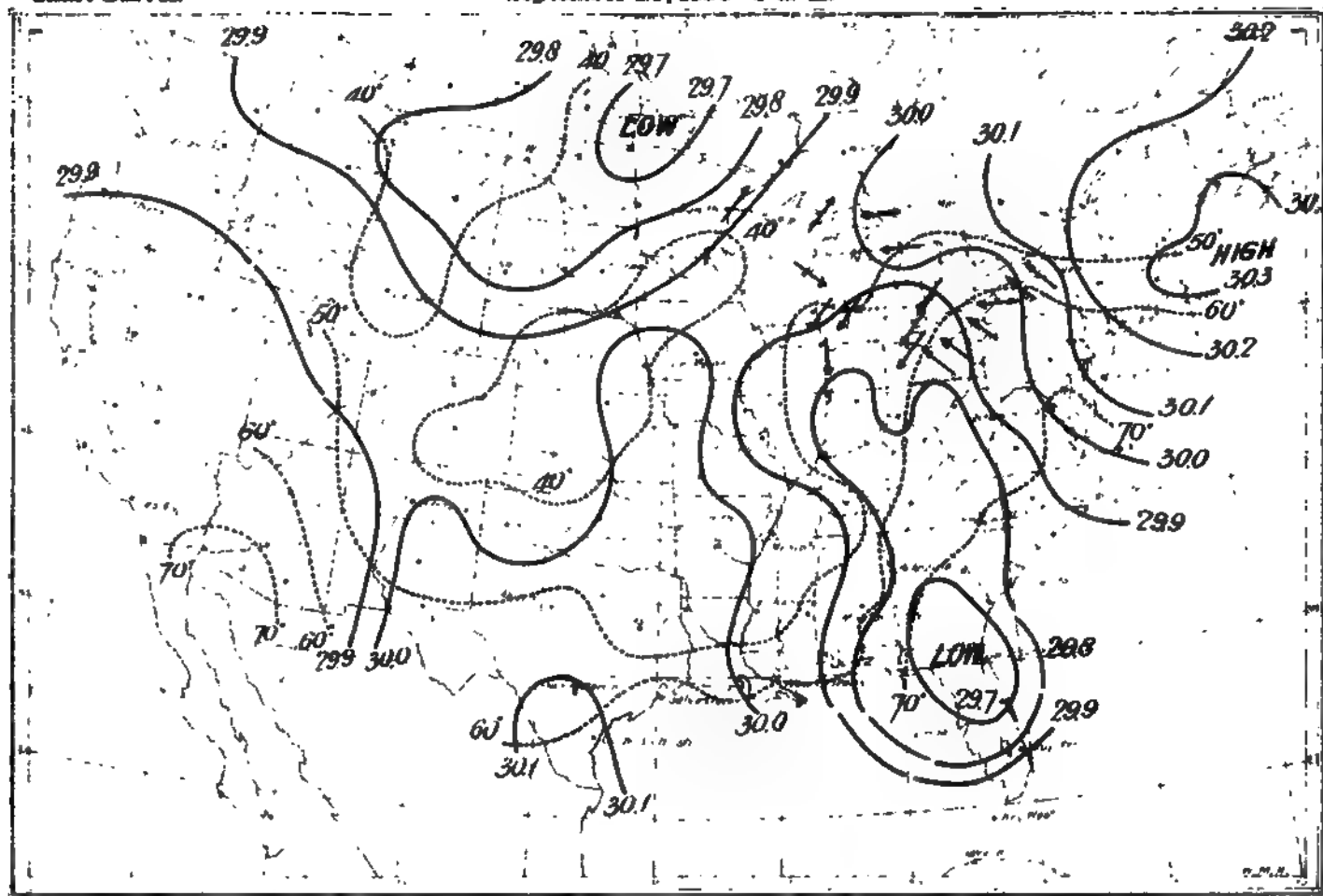


Chart DXVIII.

September 20, 1896—8 p. m.

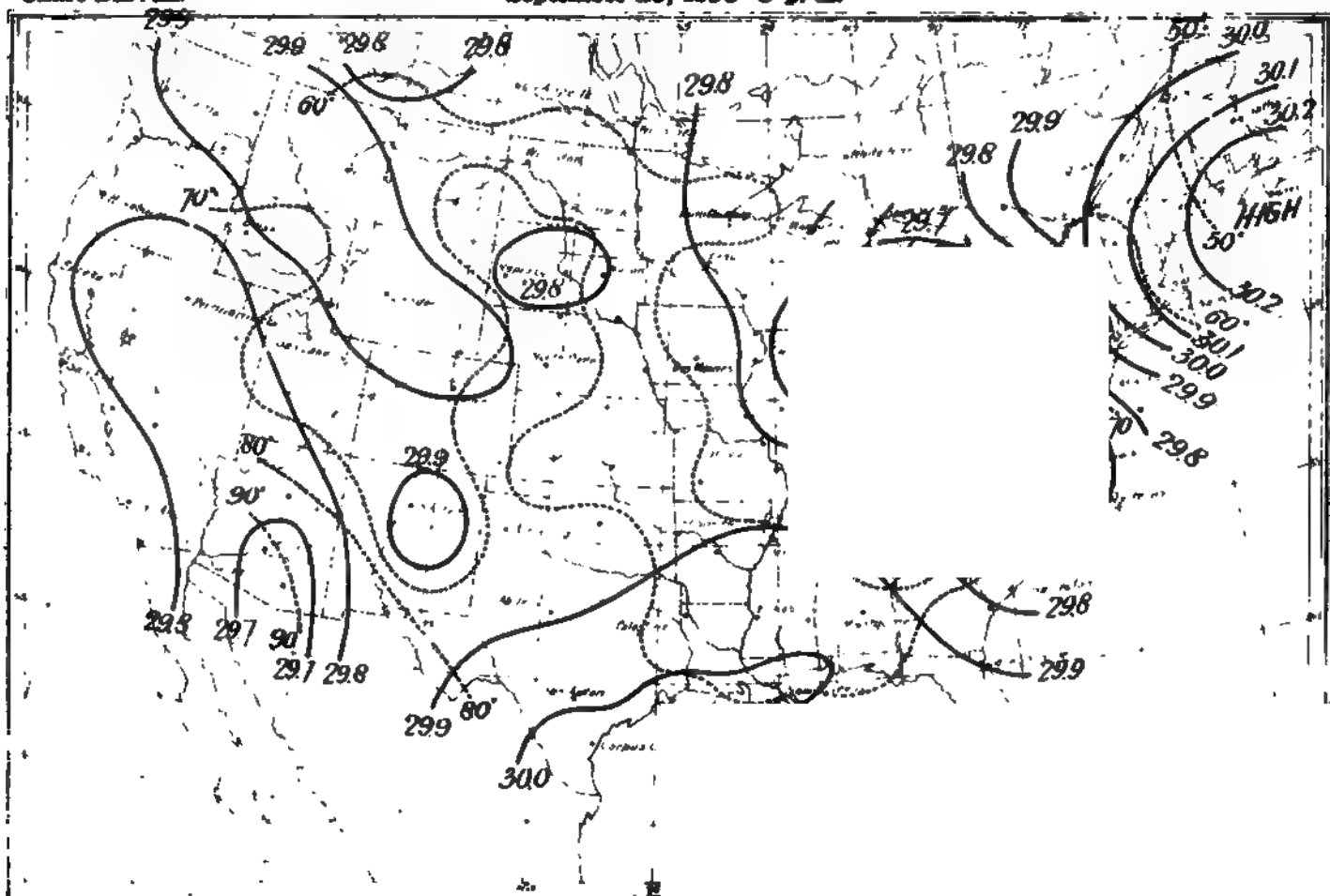


Chart DXIX.

September 30, 1896—8 a. m.

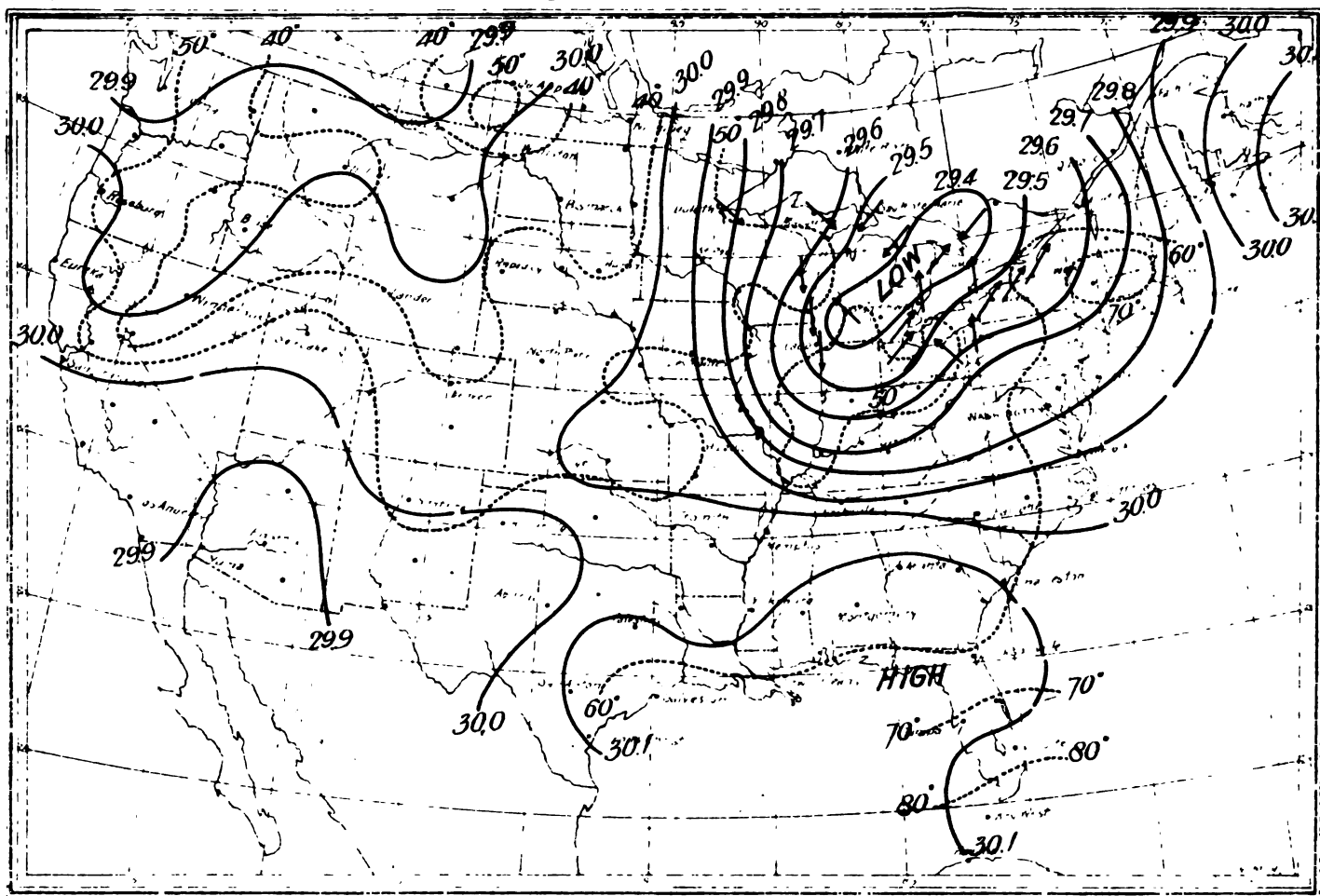


Chart DXX.

September 30, 1896—8 p. m.

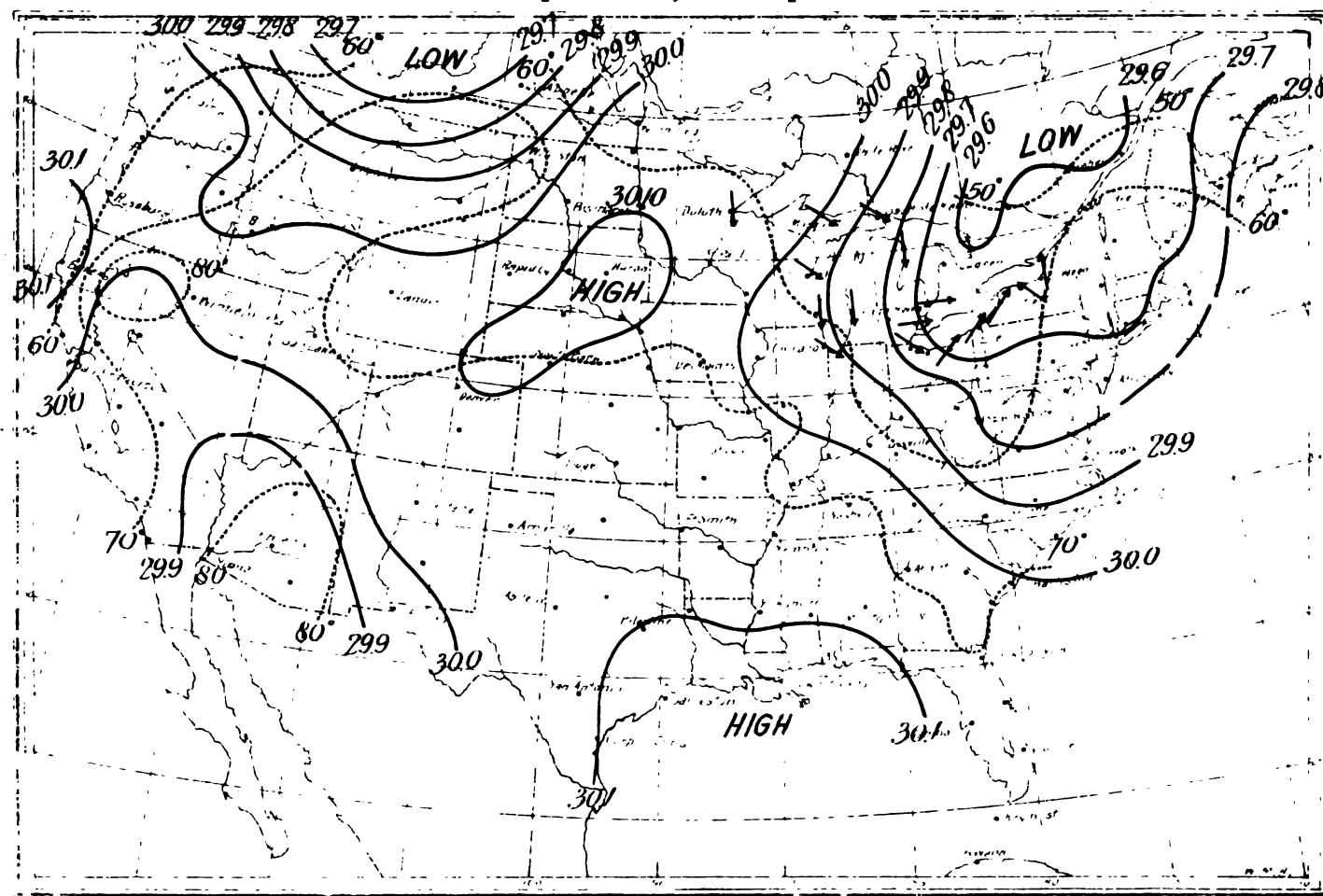


Chart DXXI.

September 28, 1899—8 a. m.

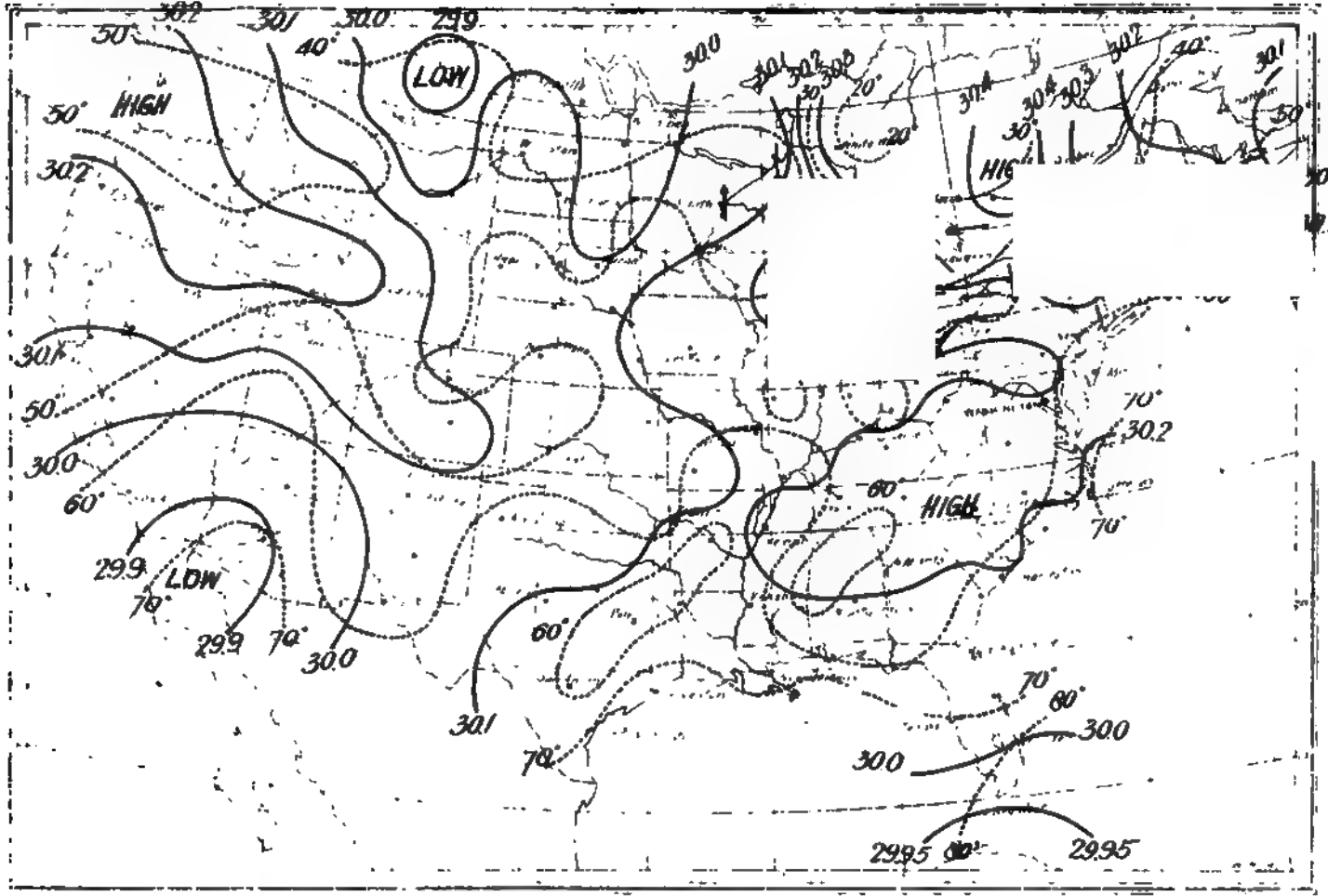


Chart DXXII.

September 28, 1899—8 p. m.

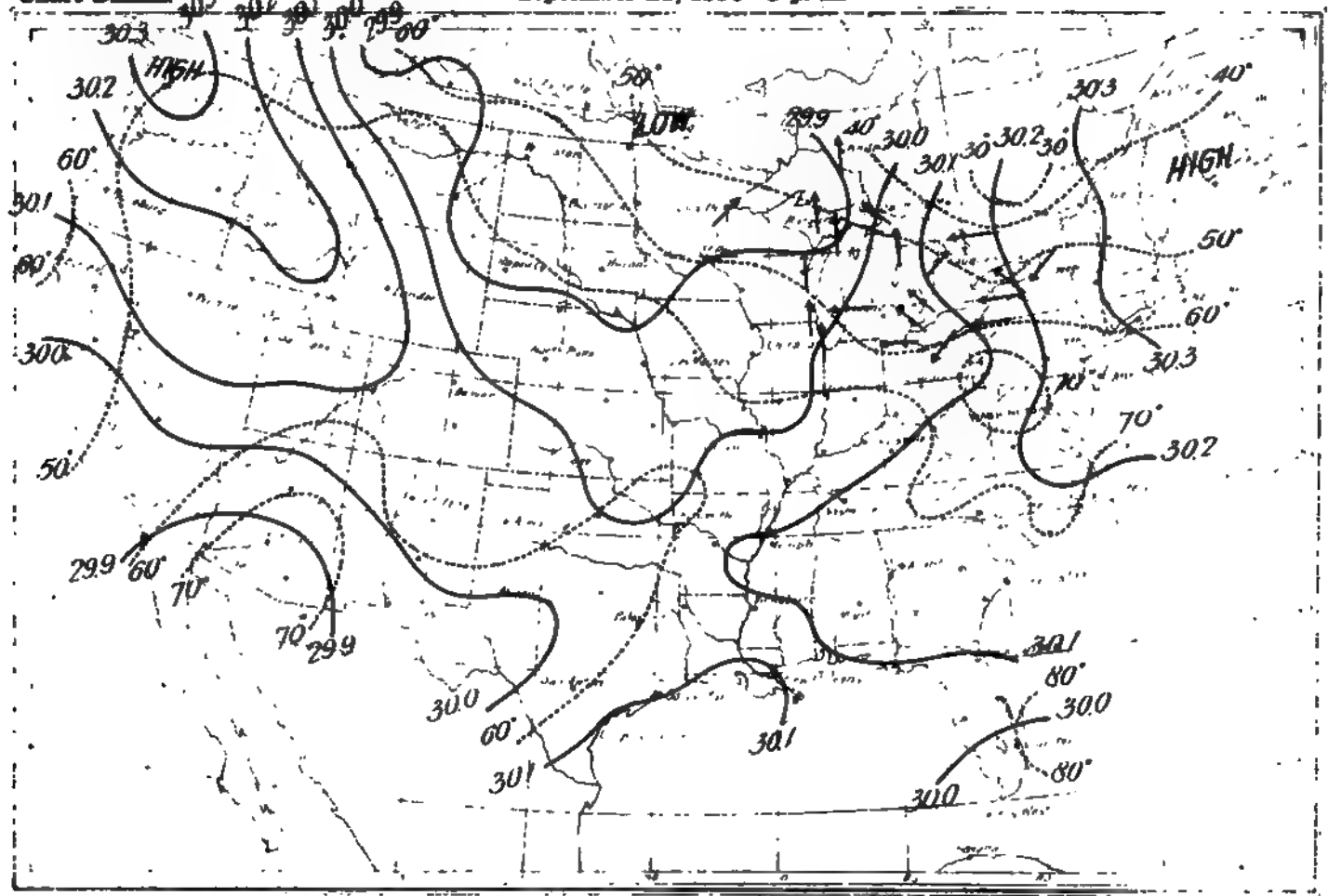


Chart DXXIII.

September 24, 1899—8 a. m.

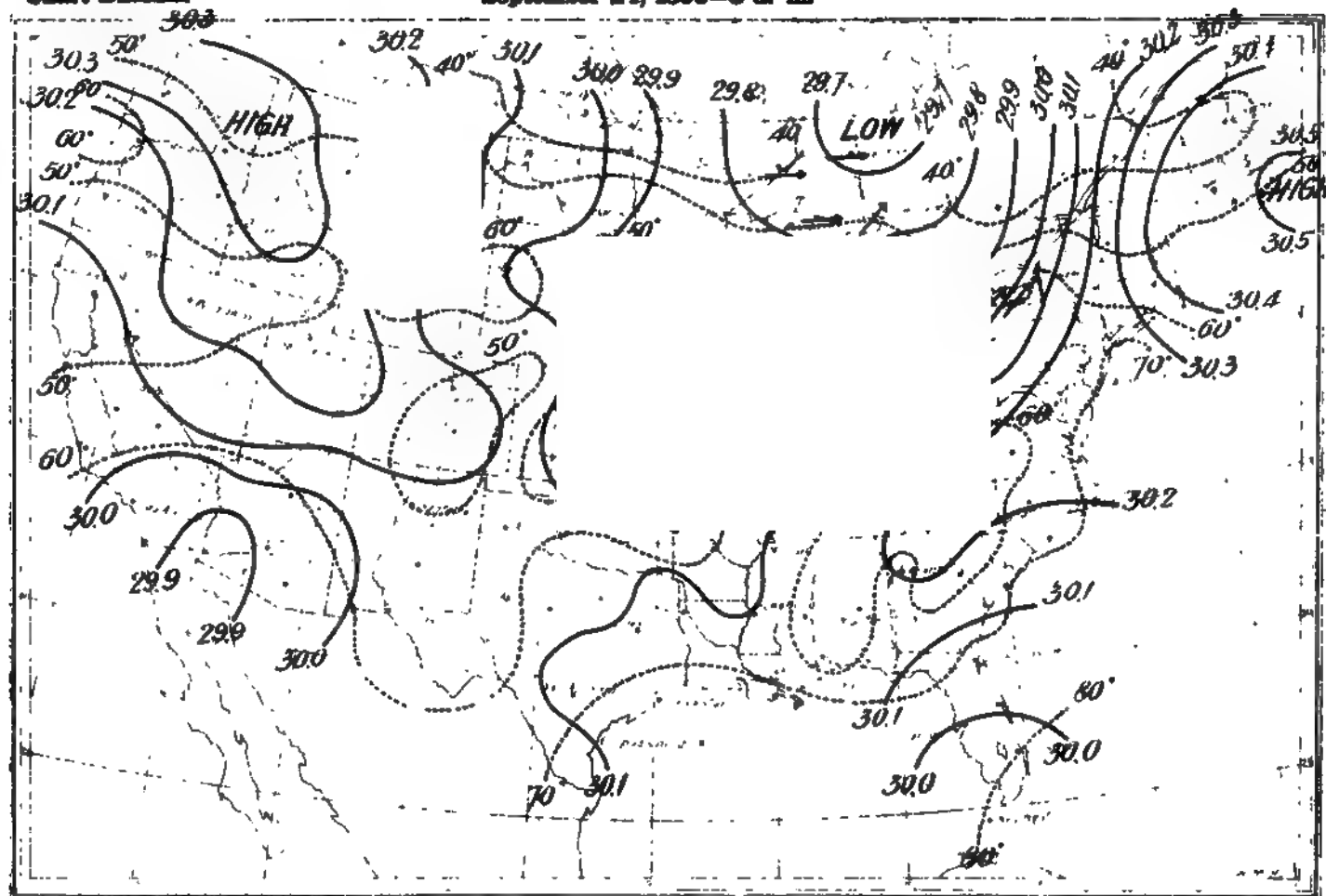


Chart DXXIV.

September 24, 1899—8 p. m.

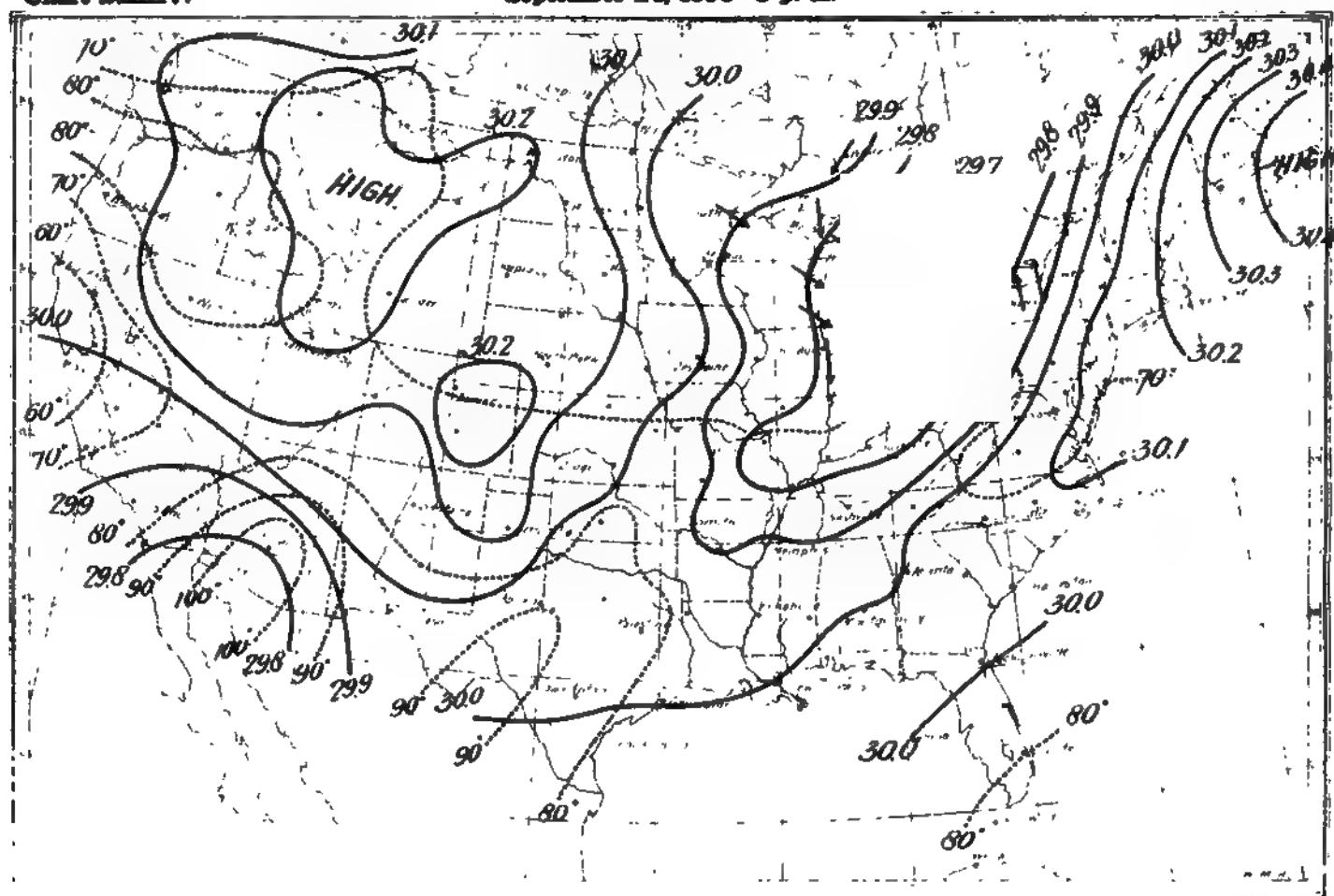


Chart DXXV.

September 27, 1899—8 a. m.

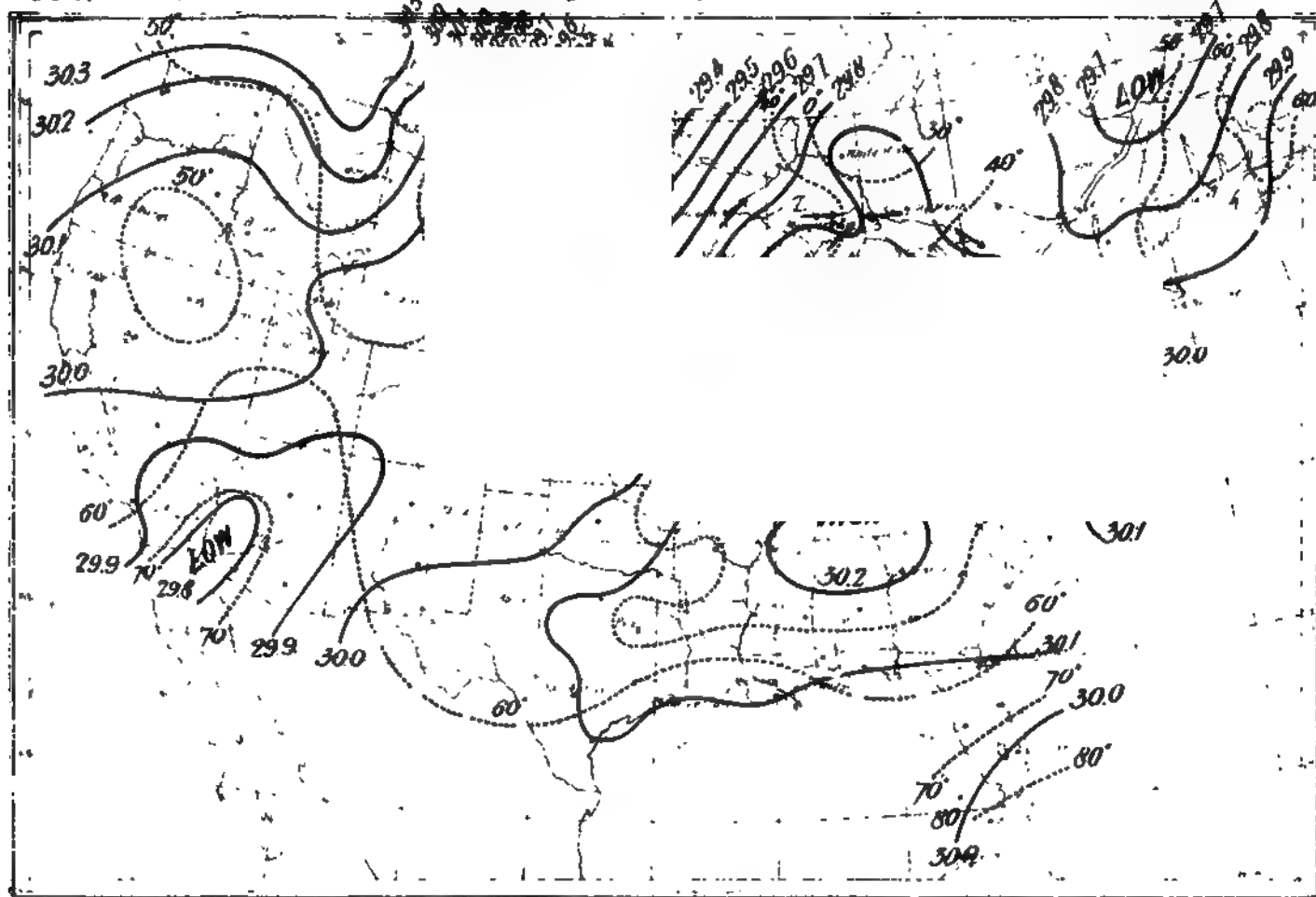


Chart DXXVI.

September 27, 1899—8 p. m.

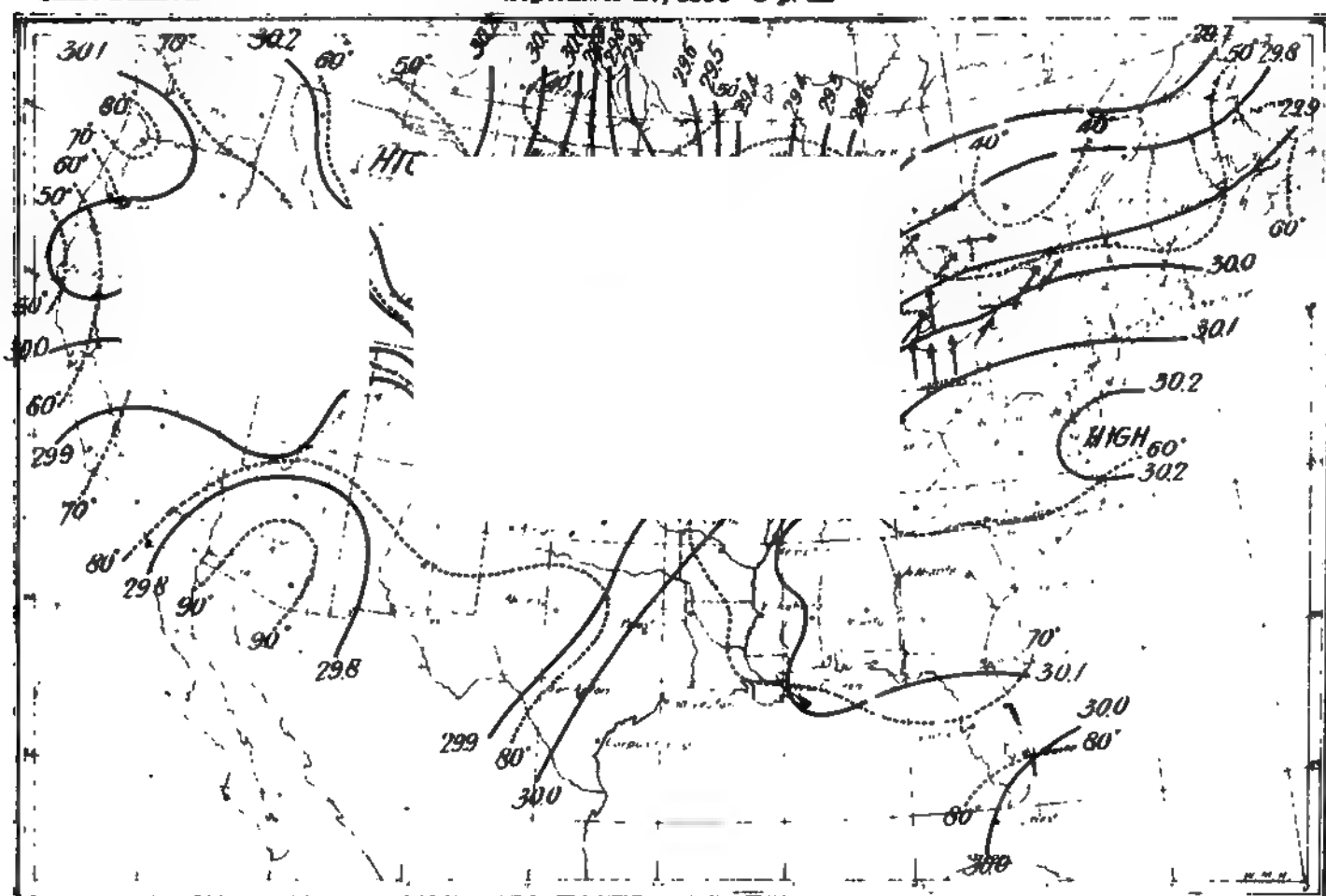


Chart DXXVII.

September 28, 1899—8 a. m.

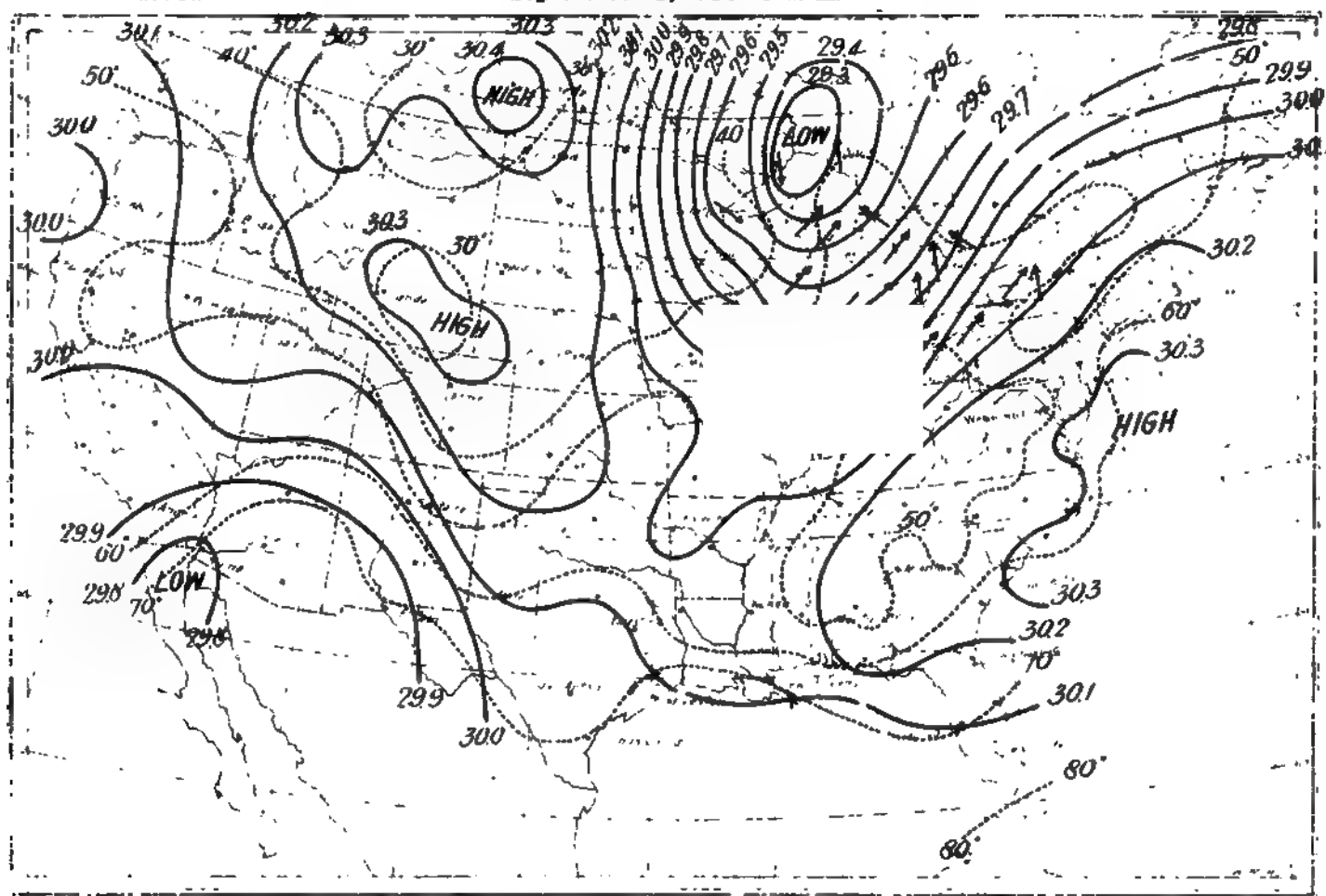


Chart DXXVIII.

September 28, 1899—8 p. m.

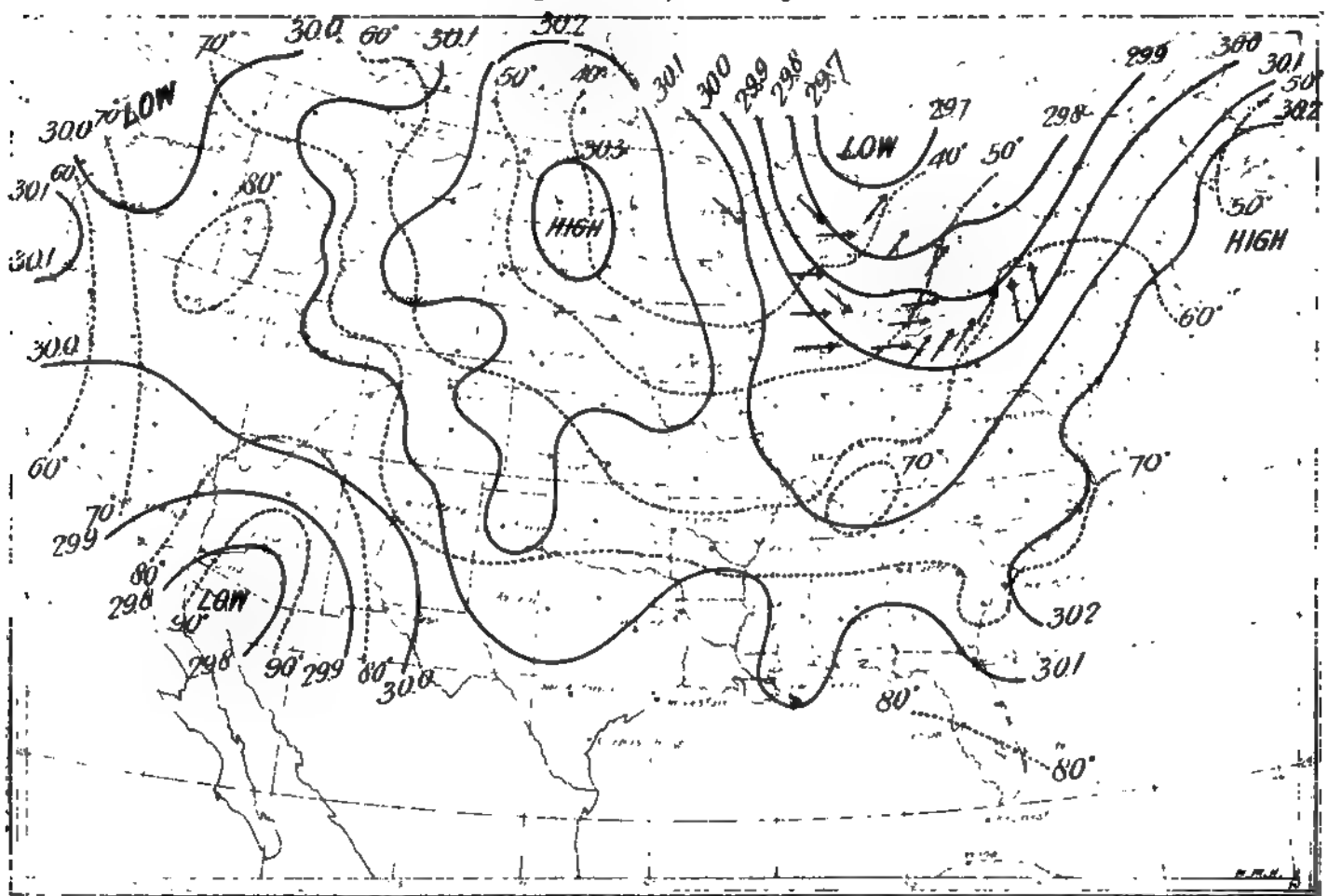


Chart DXXXIX

September 10, 1900—8 a. m.

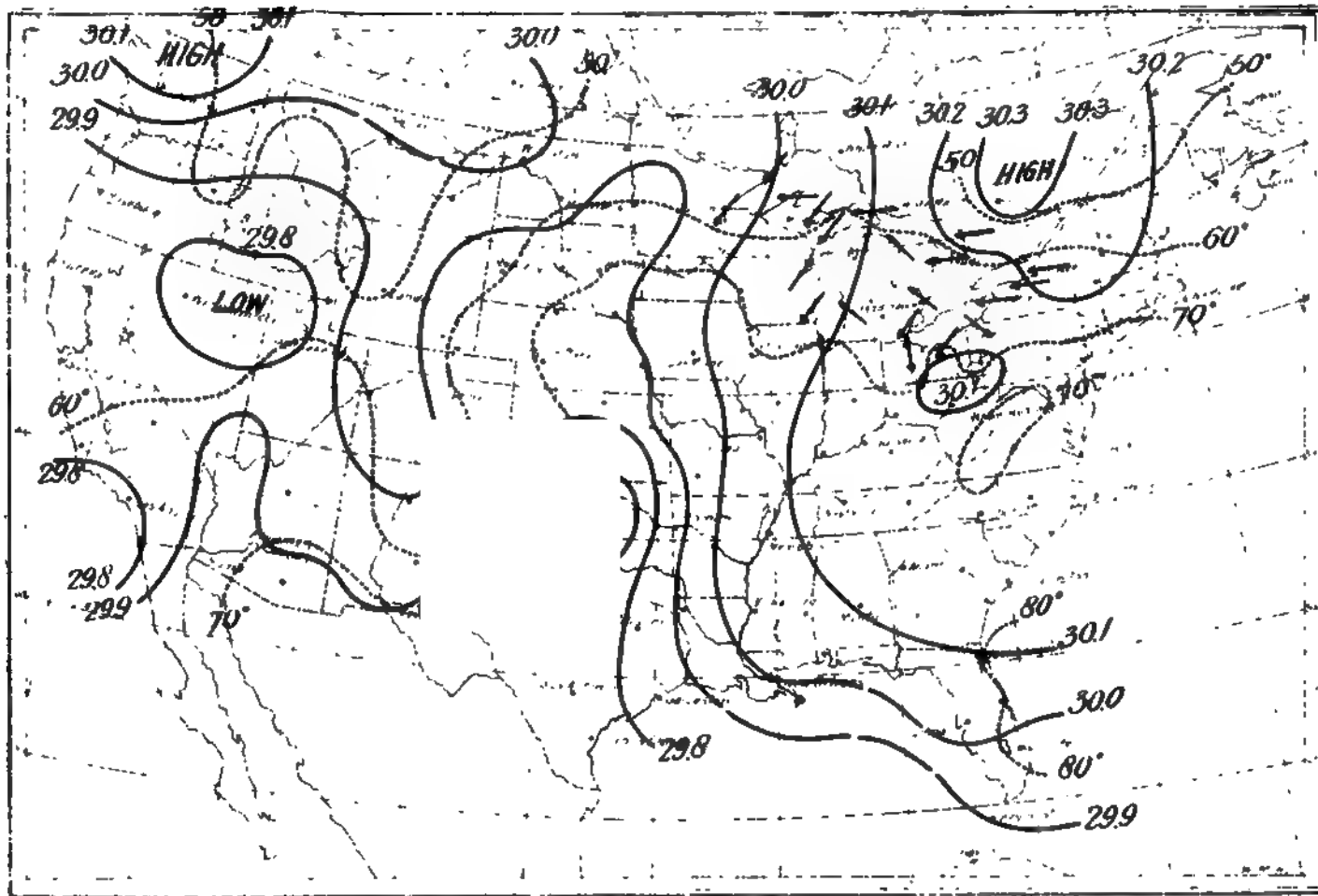
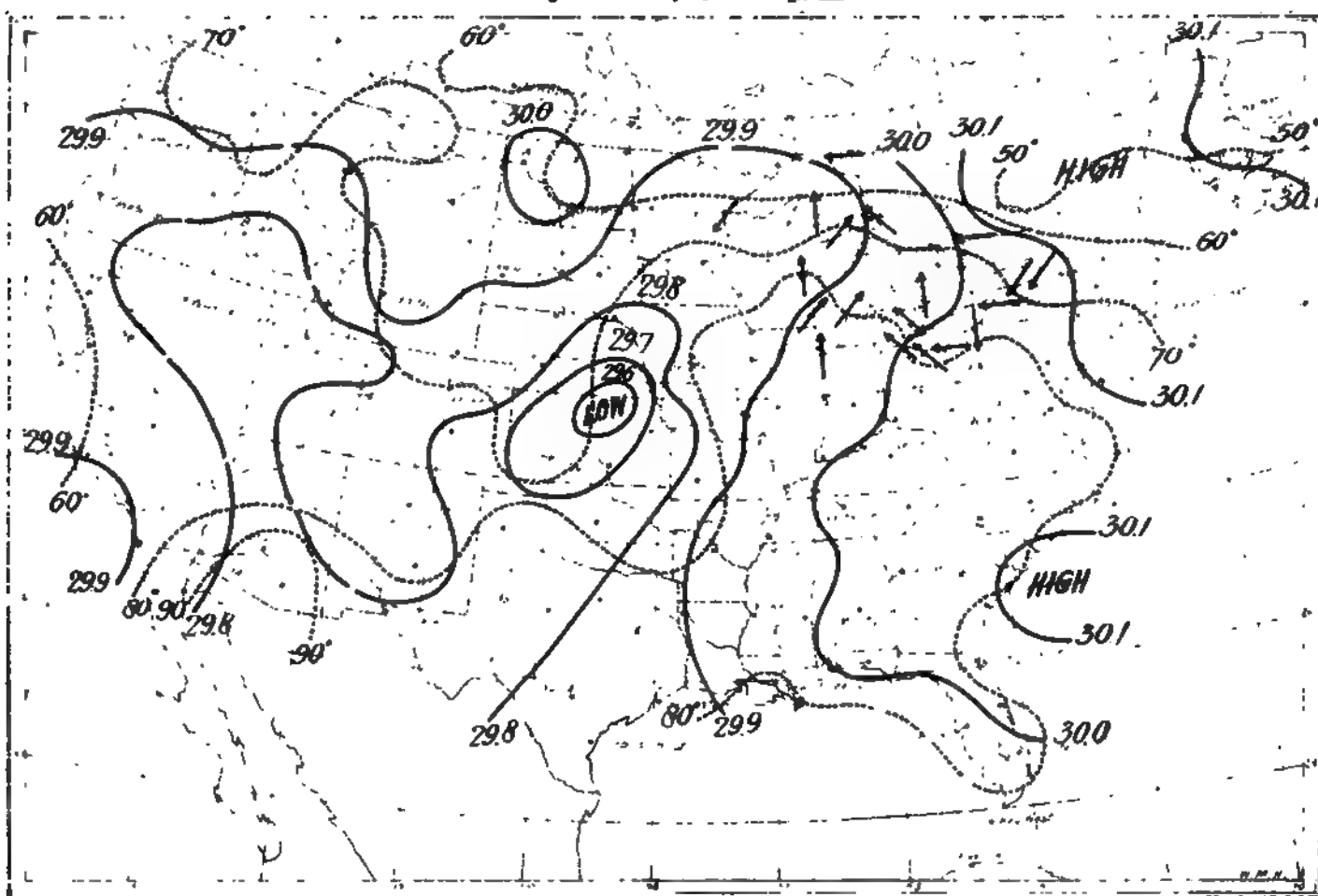
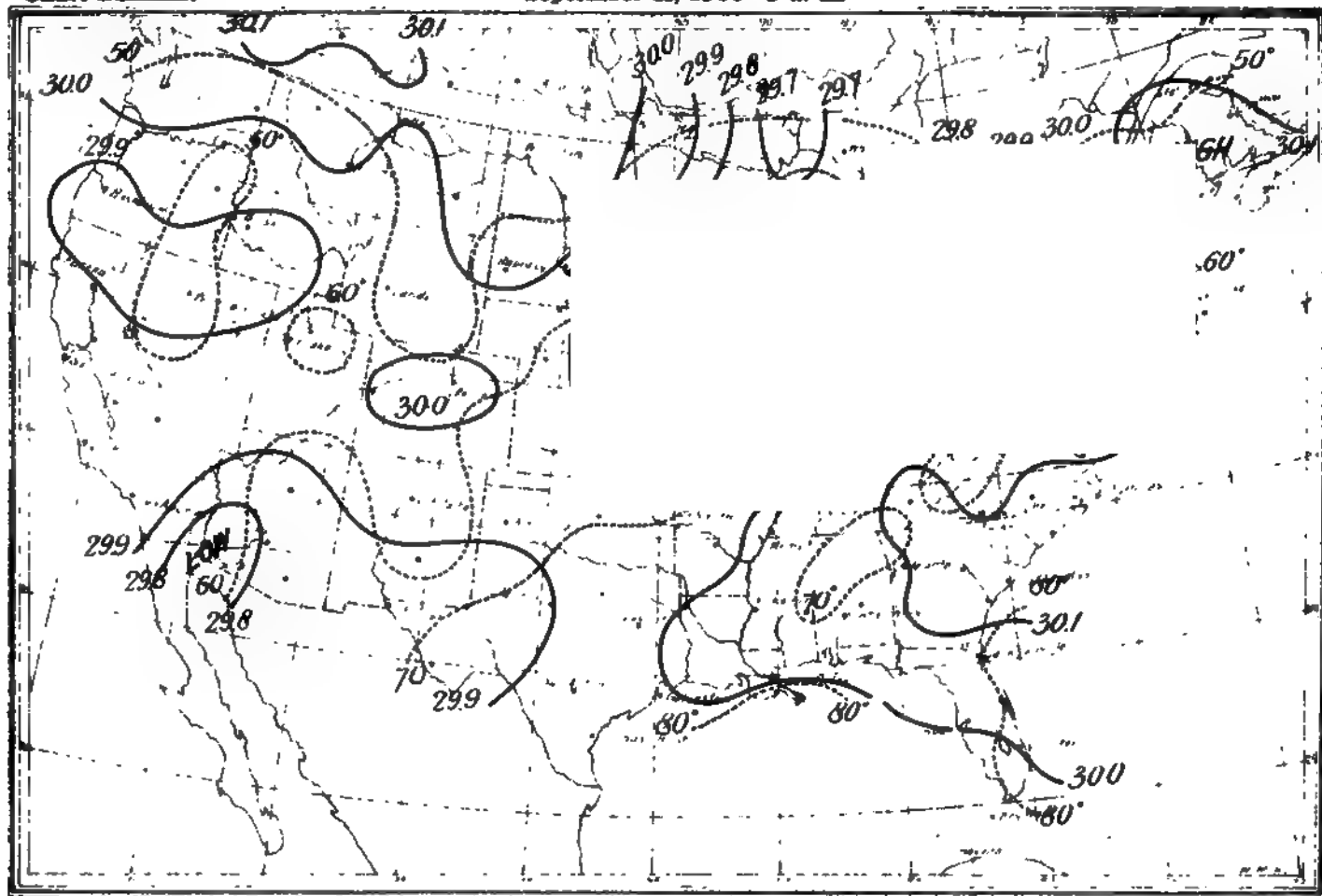


Chart DXXXX

September 10, 1900—8 p. m.



September 11, 1900—8 a. m.



September 11, 1900—8 p. m.

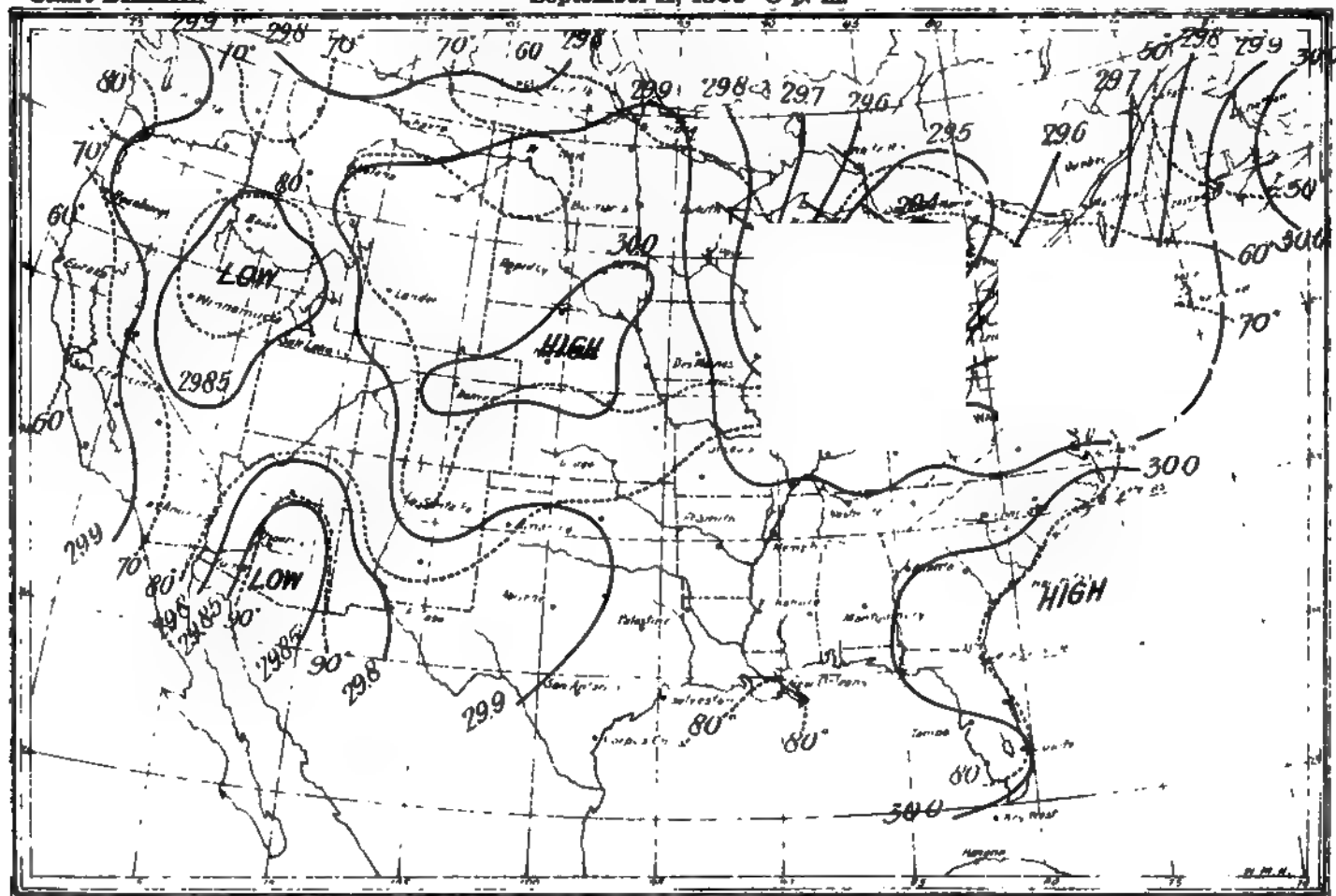


Chart DXXXIII.

October 12, 1876—4:35 p. m.

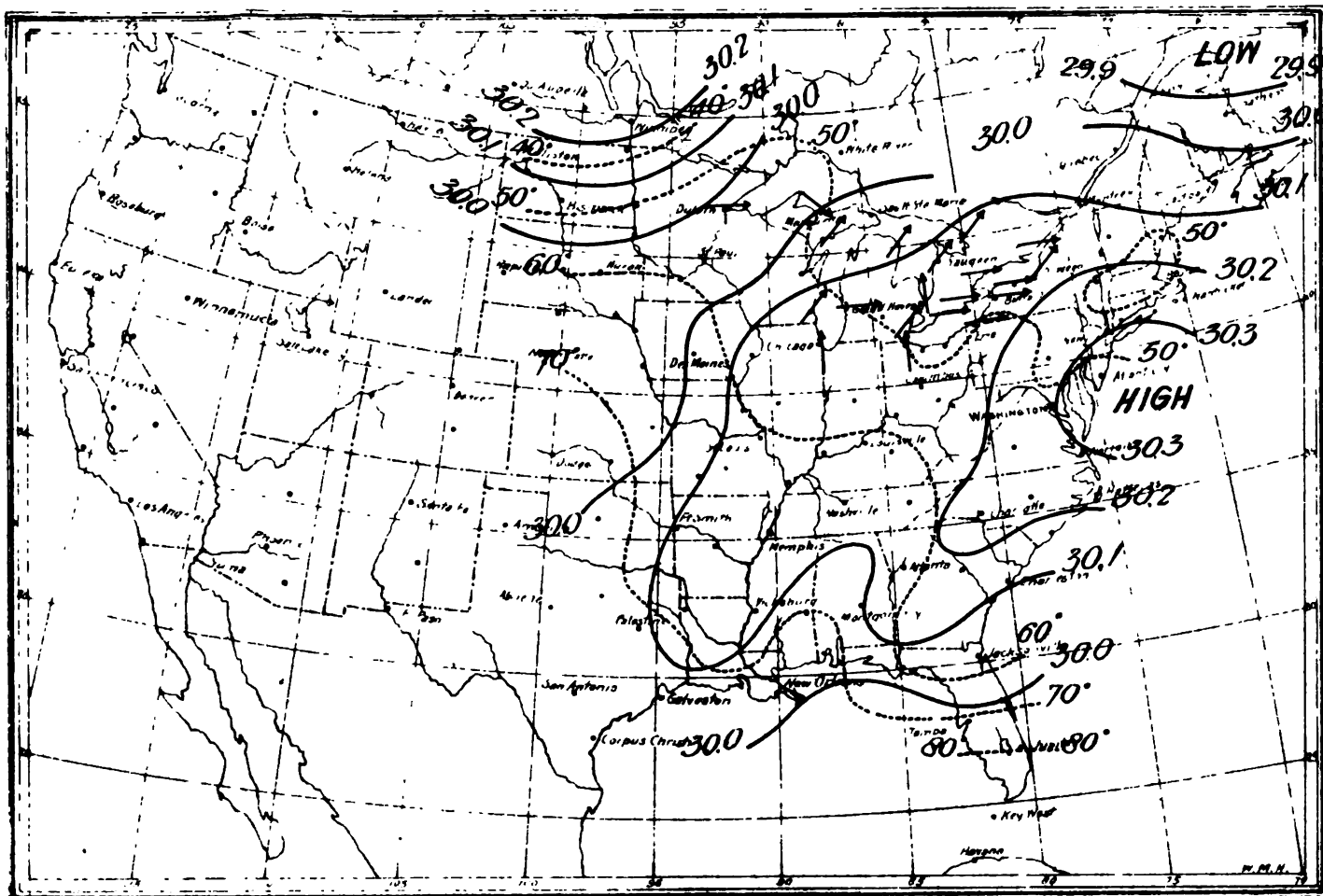


Chart DXXXIV.

October 13, 1876—7:35 a. m.

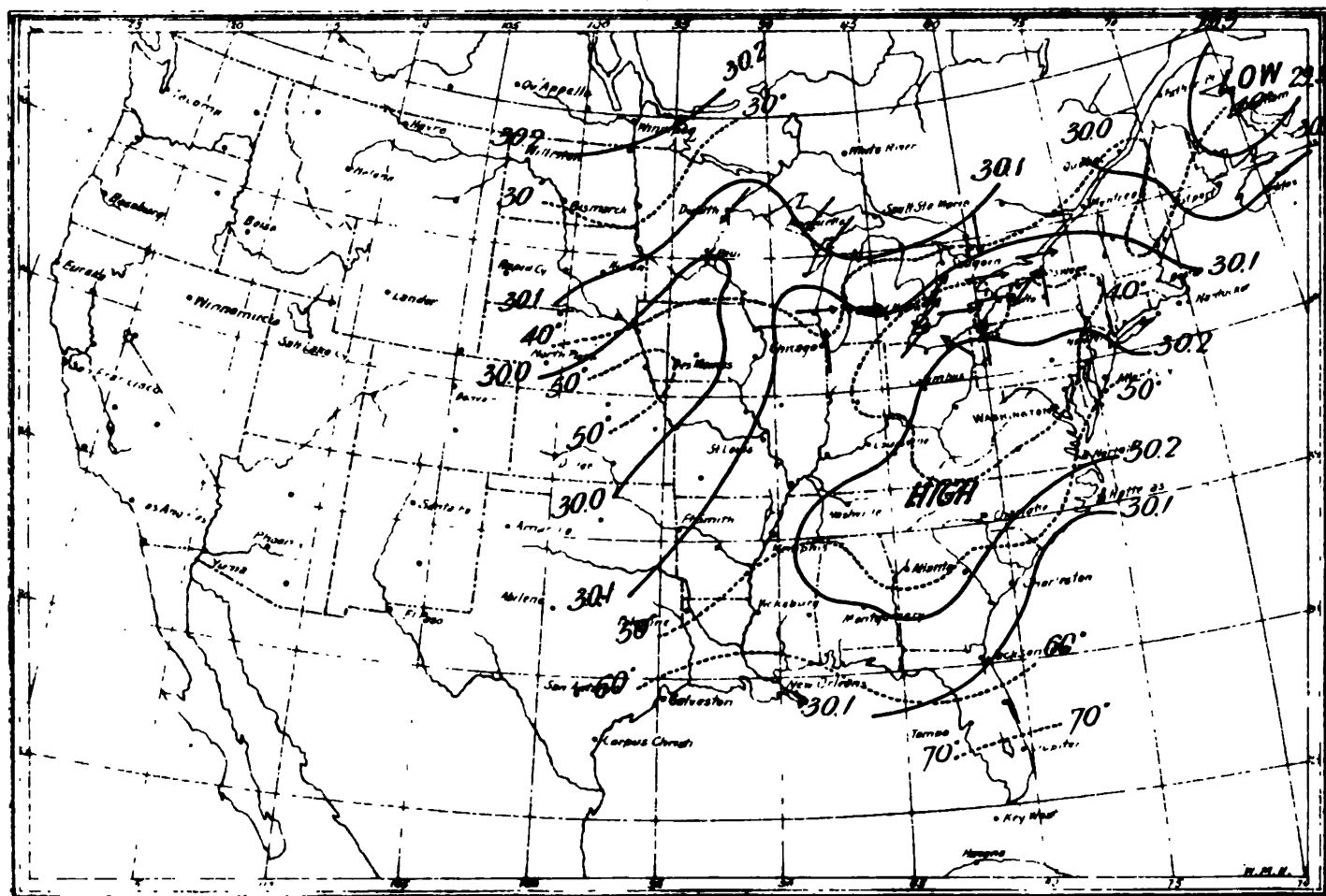


Chart DXXXV.

October 13, 1876—4:35 p. m.

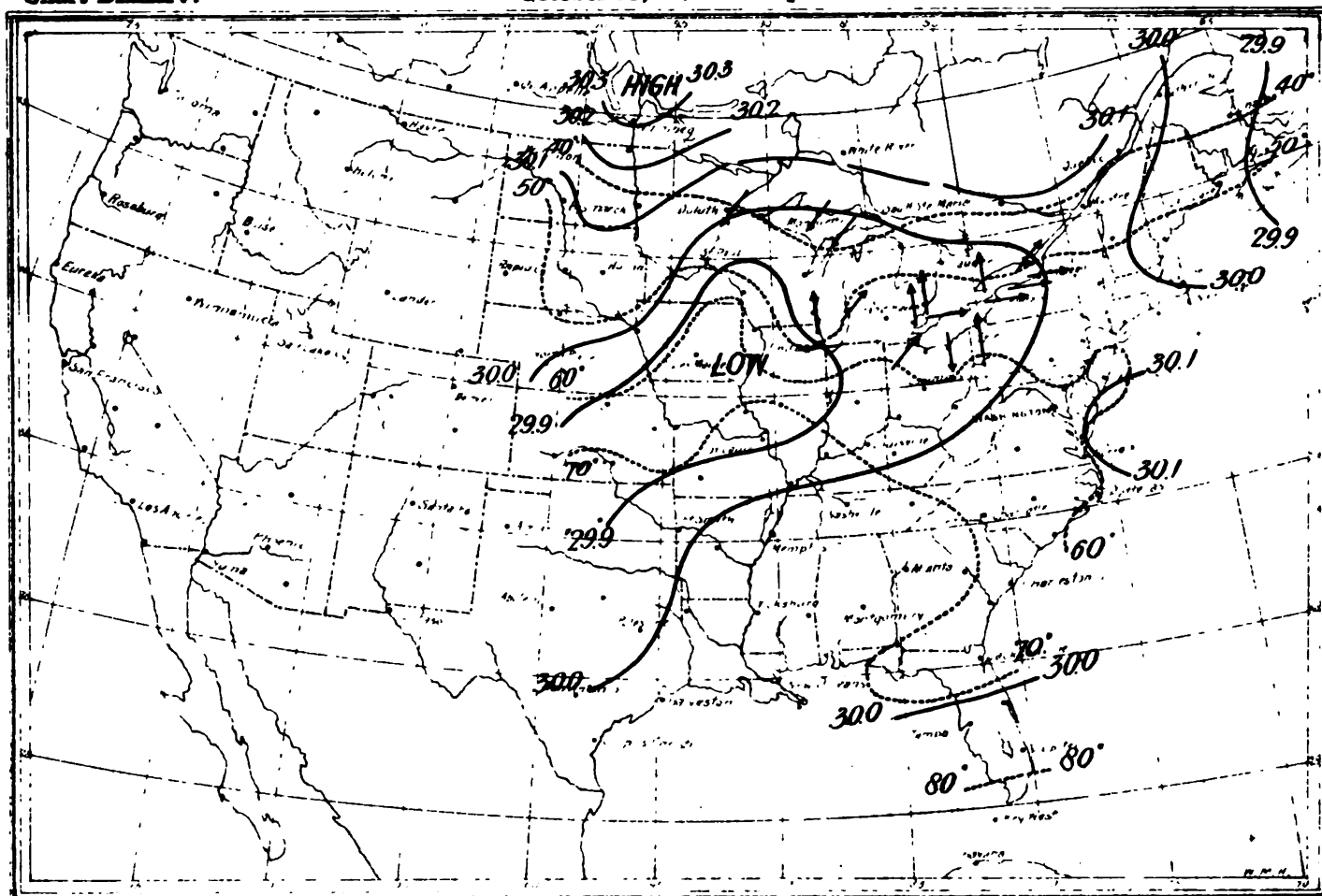


Chart DXXXVI.

October 14, 1876—7:35 a. m.

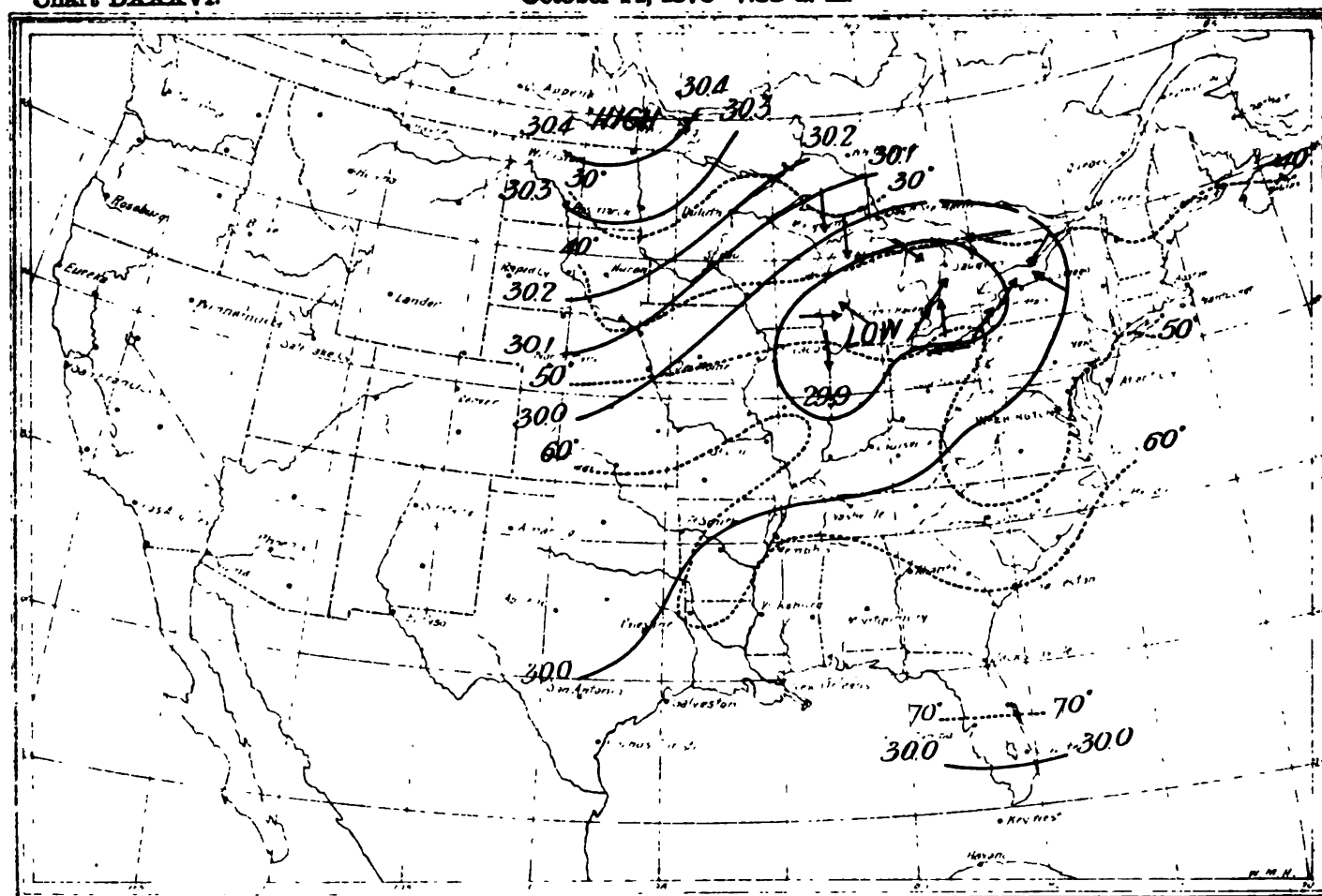


Chart DXXXVII.

October 2, 1877—4:35 p. m.

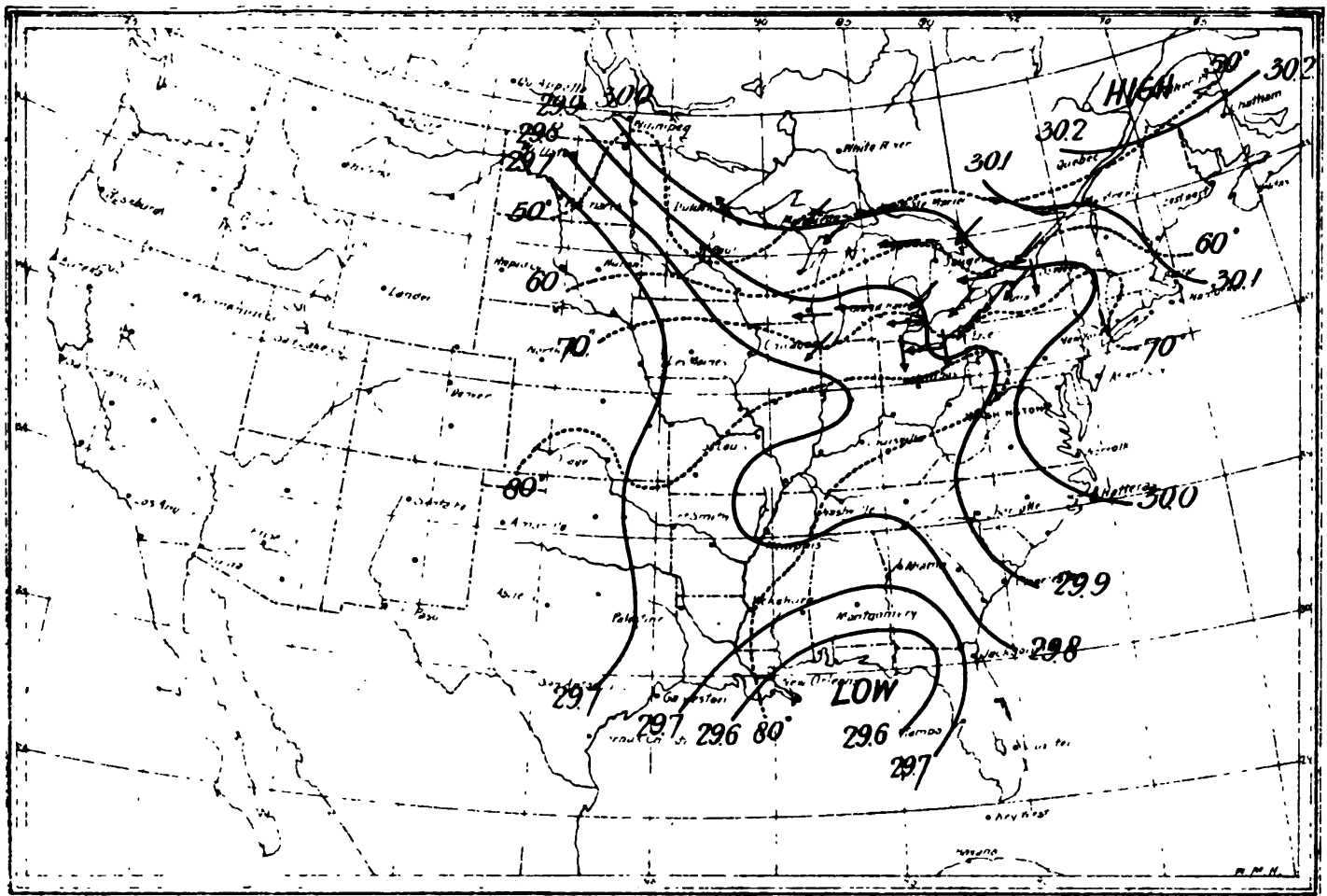
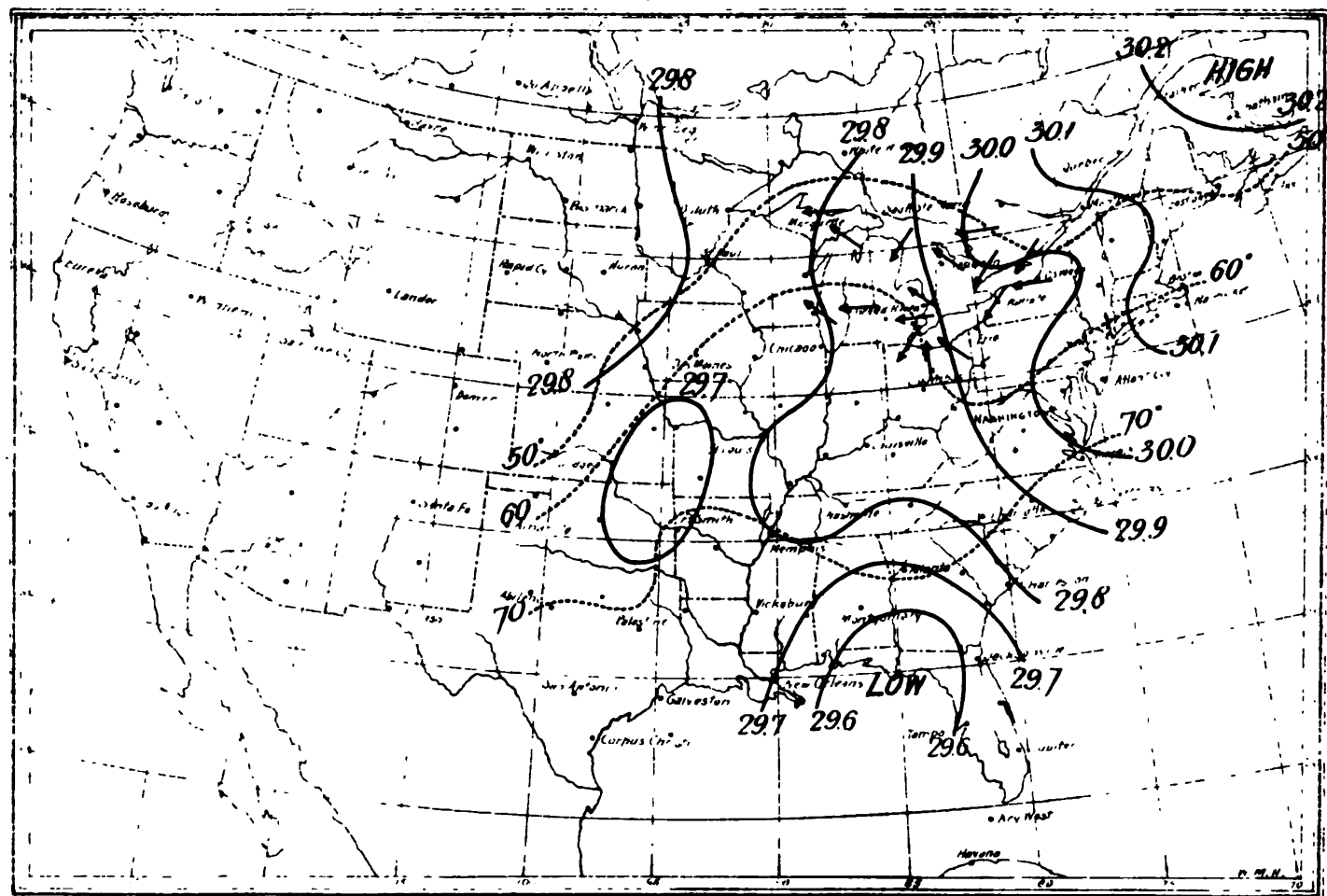


Chart DXXXVIII.

October 3, 1877—7:35 a. m.



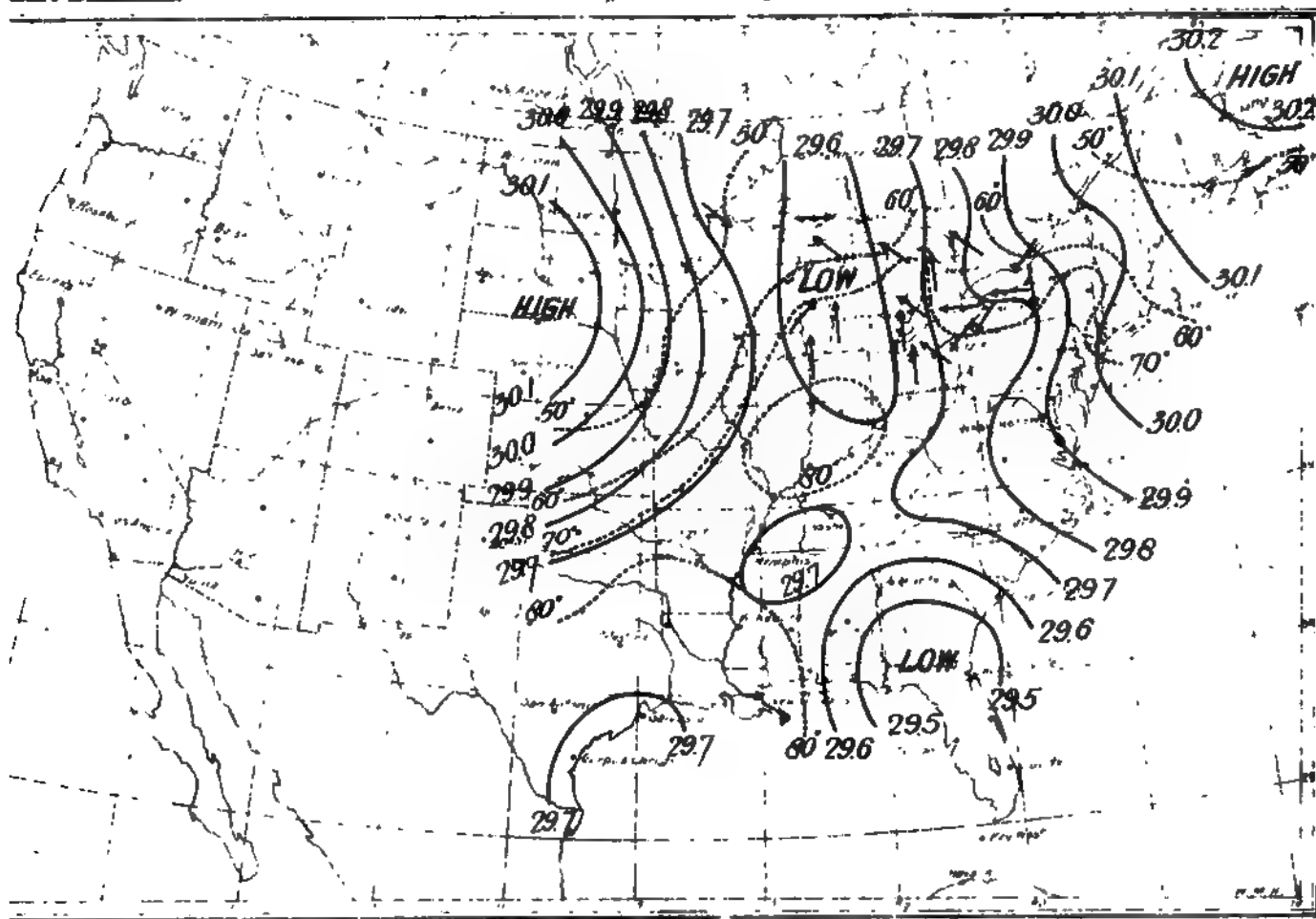


Chart DXLI.

October 8, 1878—7:35 a. m.

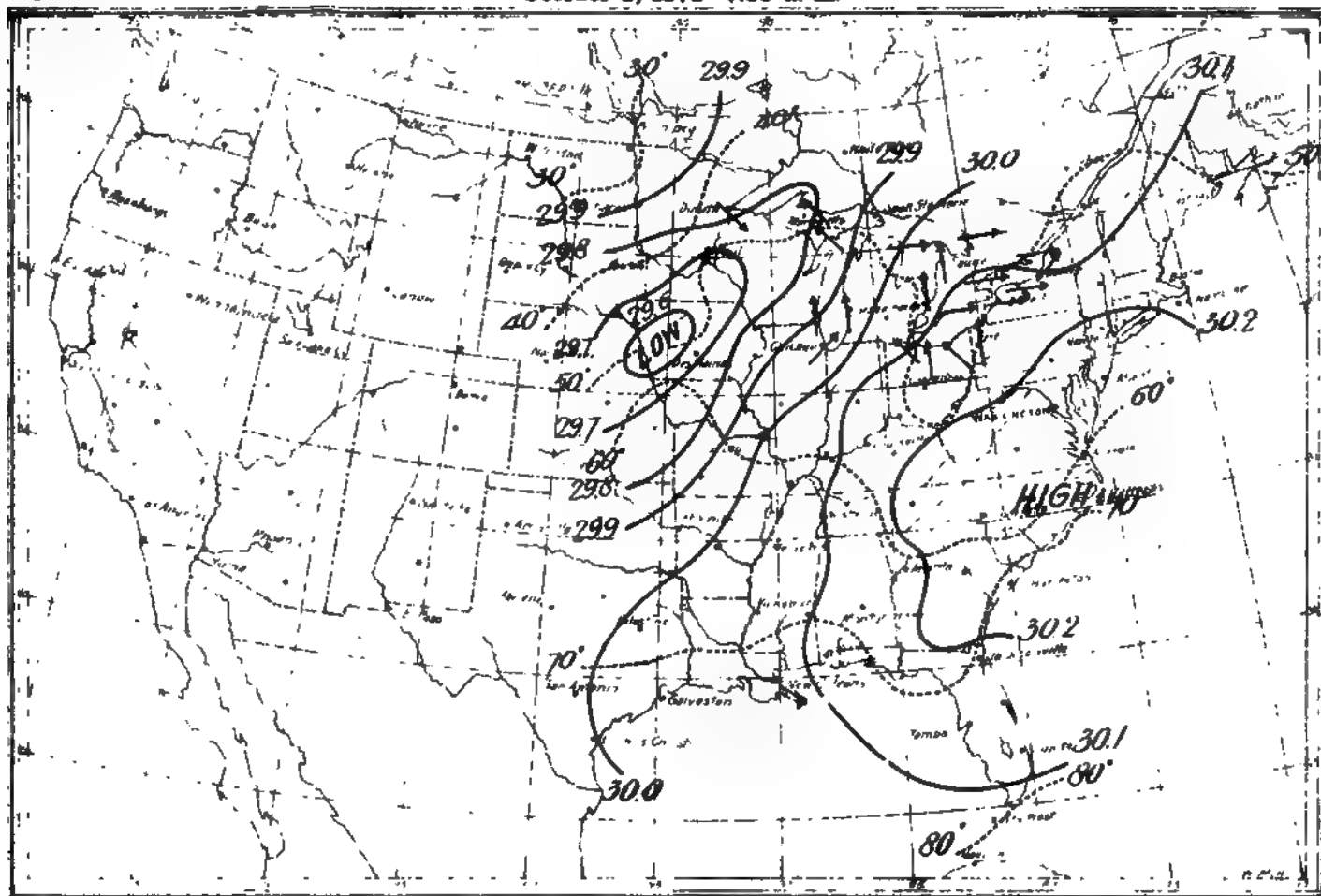
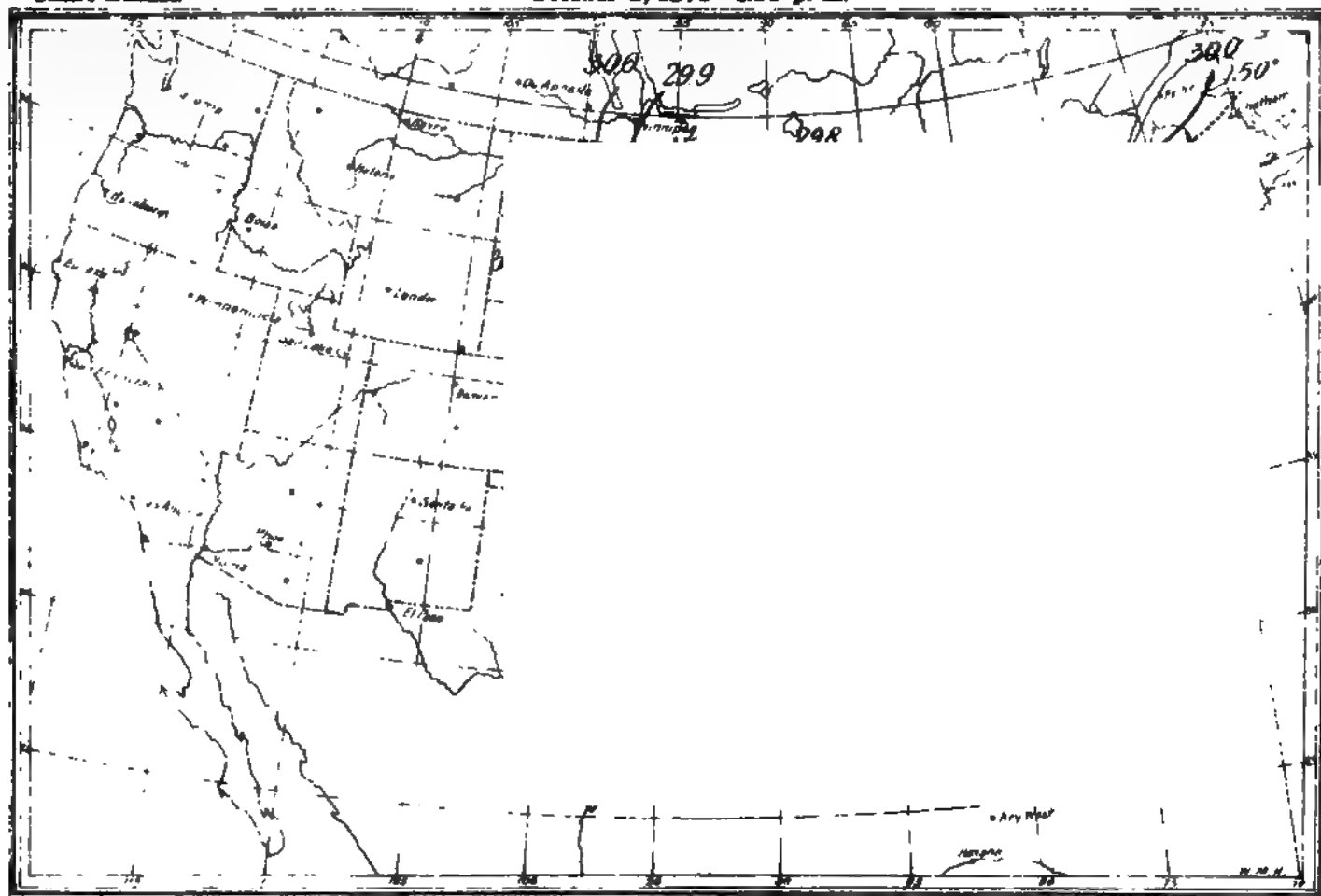


Chart DXLII.

October 8, 1878—4:35 p. m.



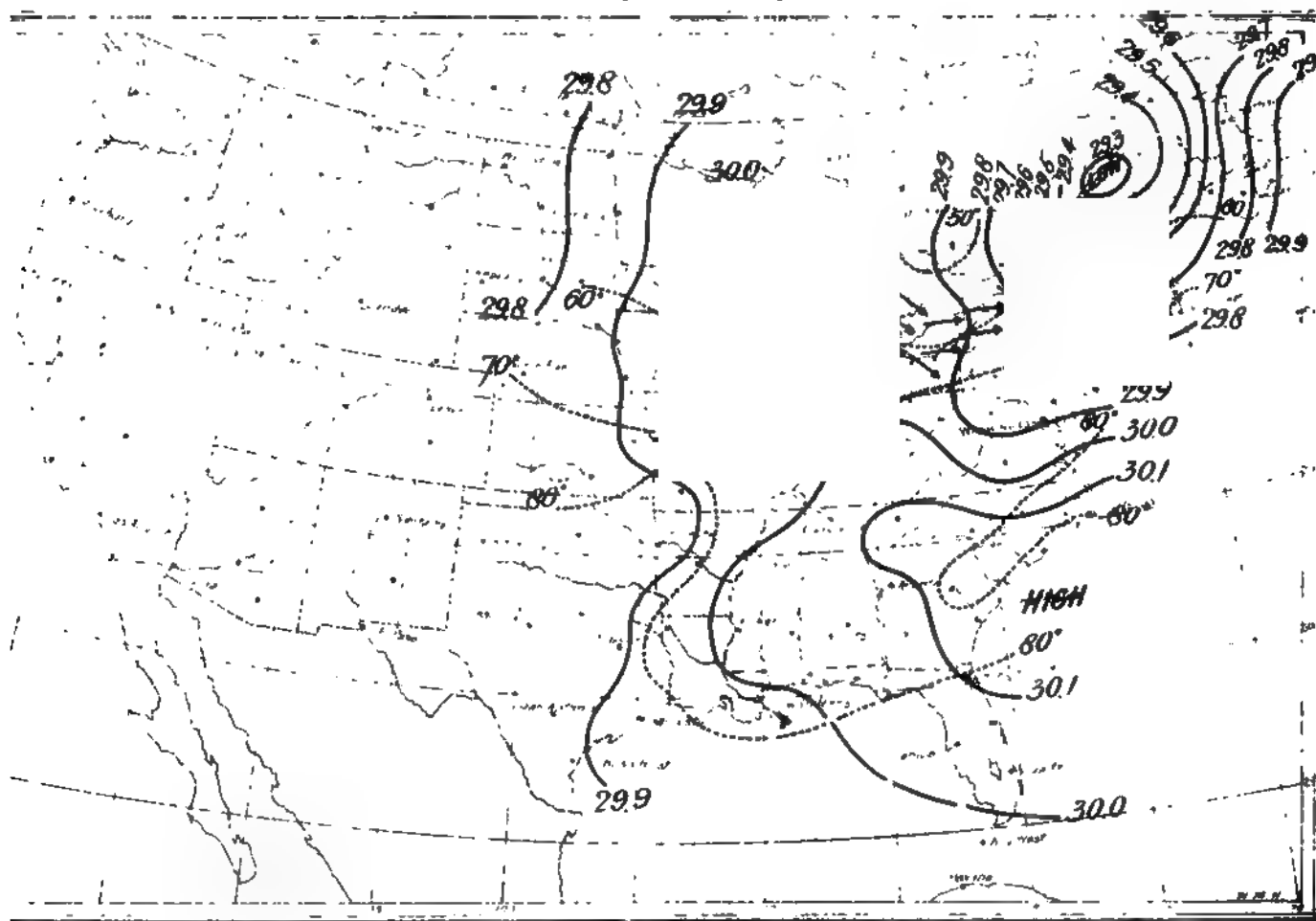
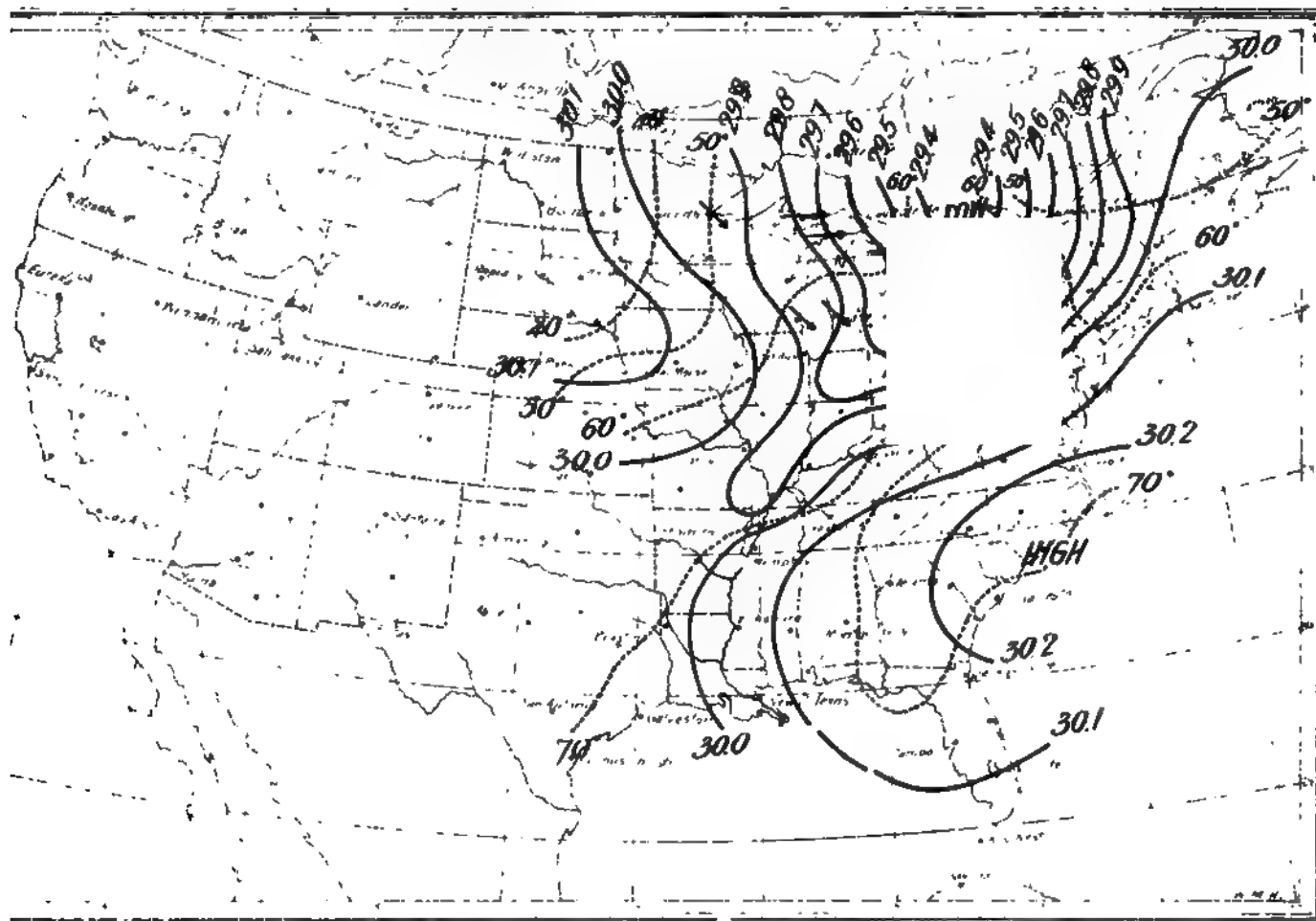


Chart DXLV.

October 21, 1879—4:35 p. m.

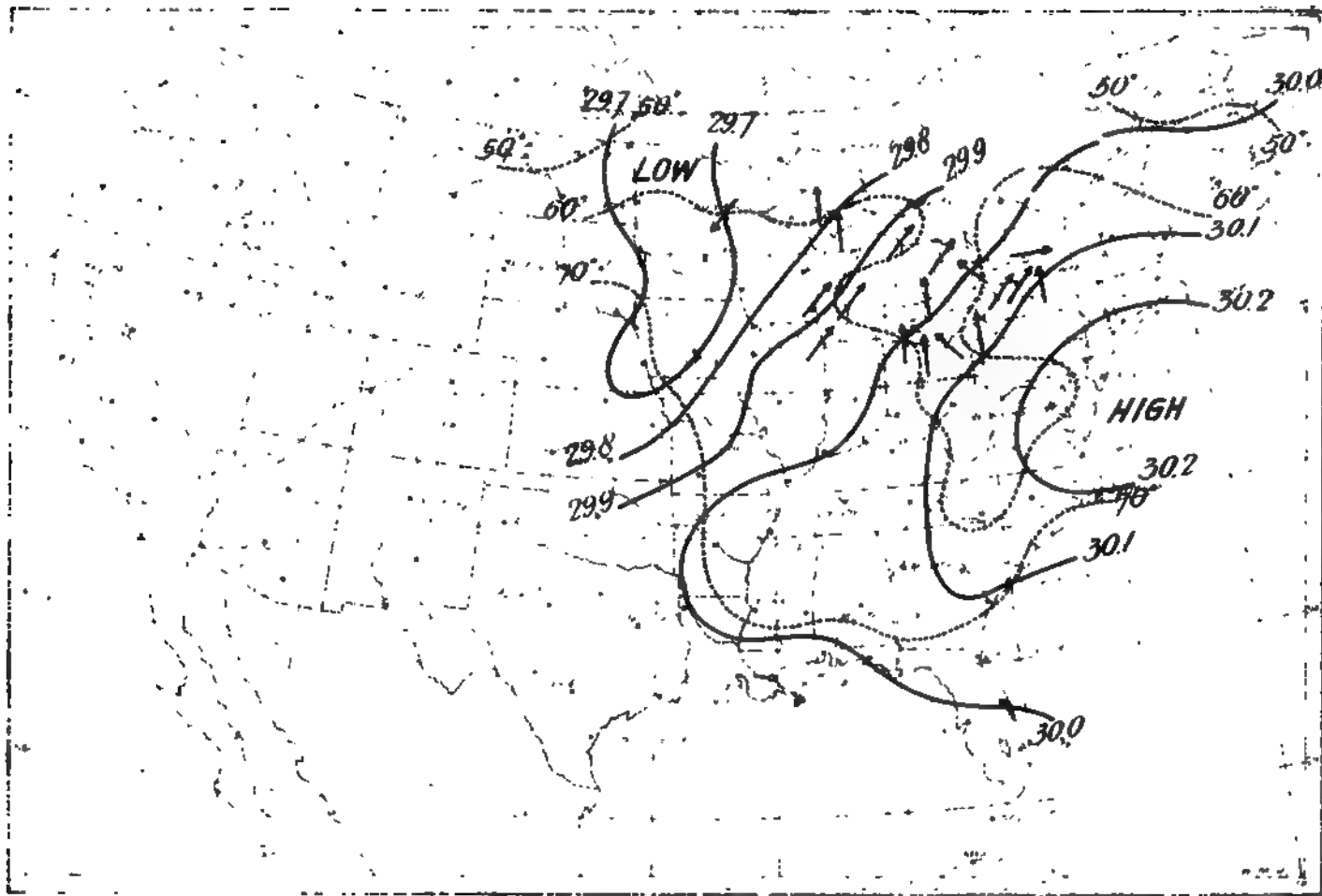


Chart DXLVI.

October 22, 1879—7:35 a. m.

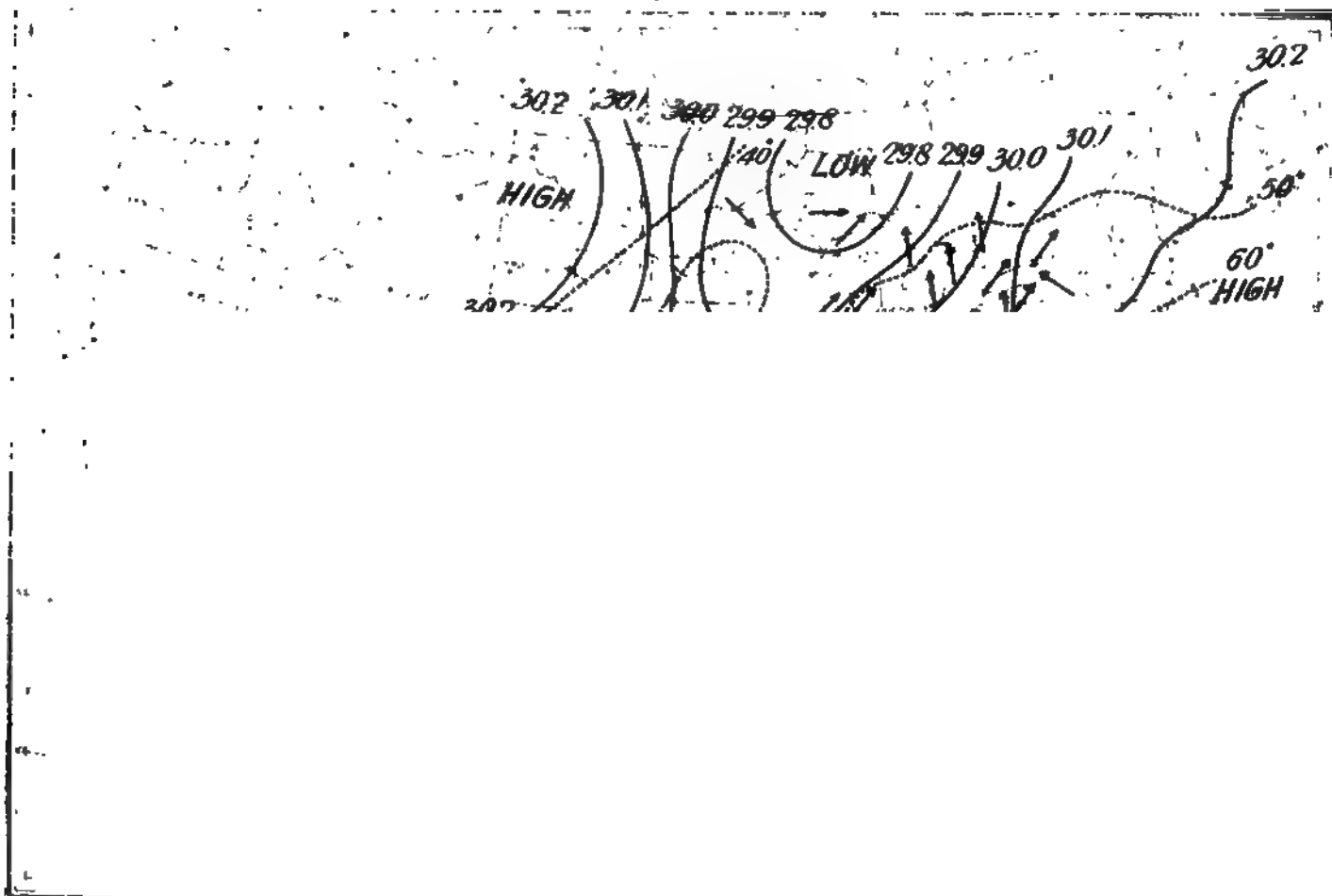


Chart DXLVII.

October 22, 1879—4:35 p. m.

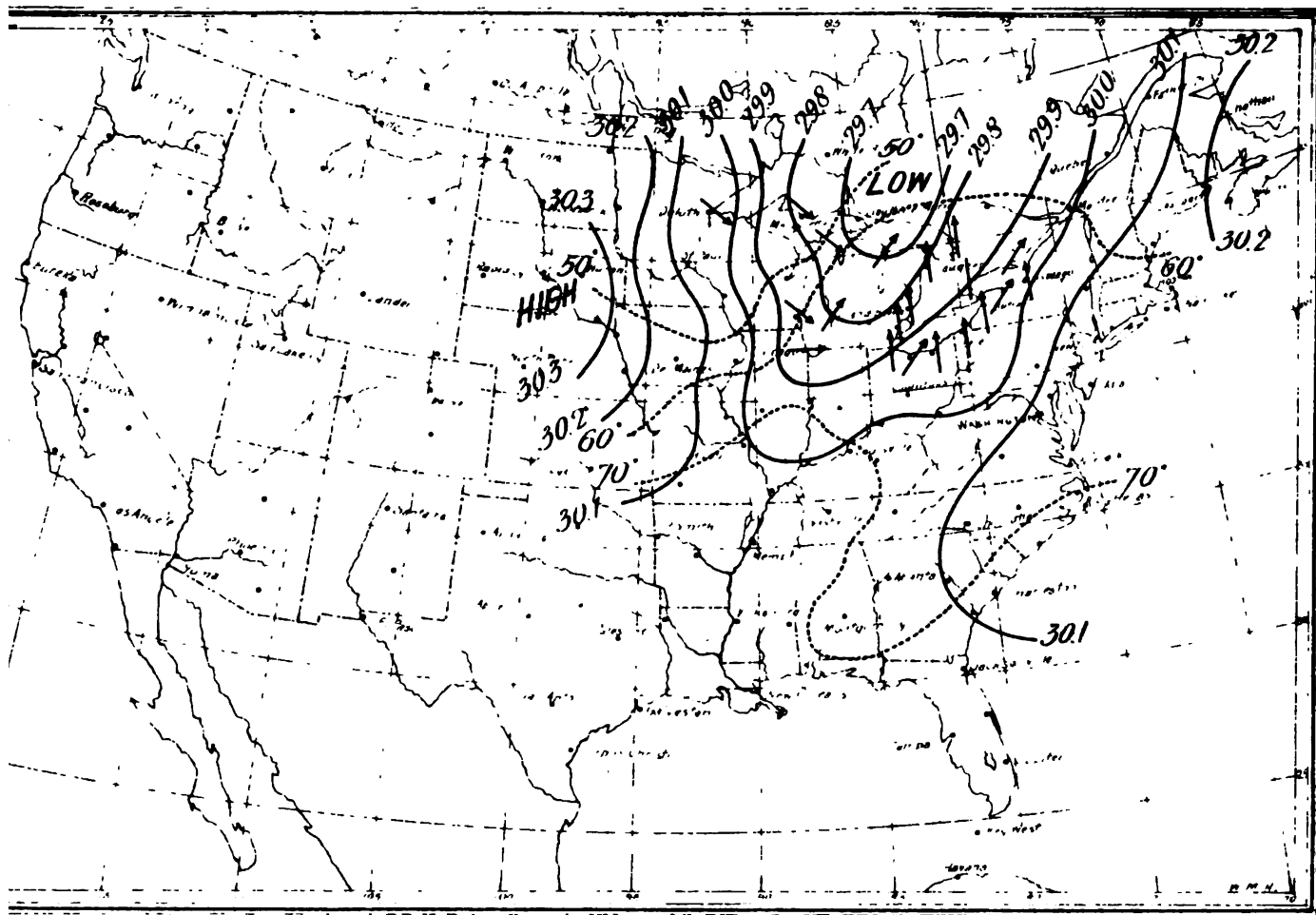


Chart DXLVIII.

October 23, 1879—7:35 a. m.

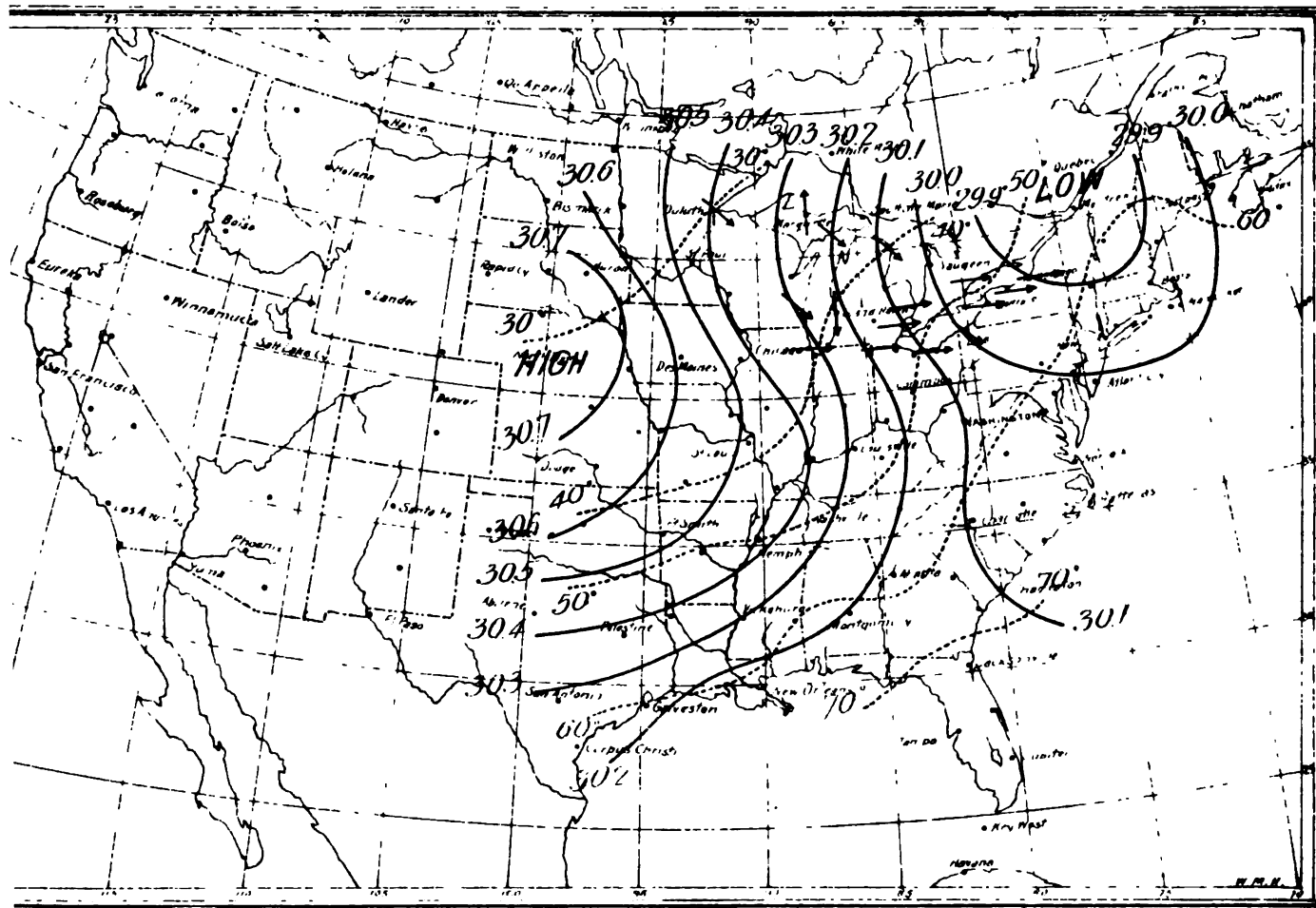


Chart DXLIX.

October 28, 1870—7:35 a. m.

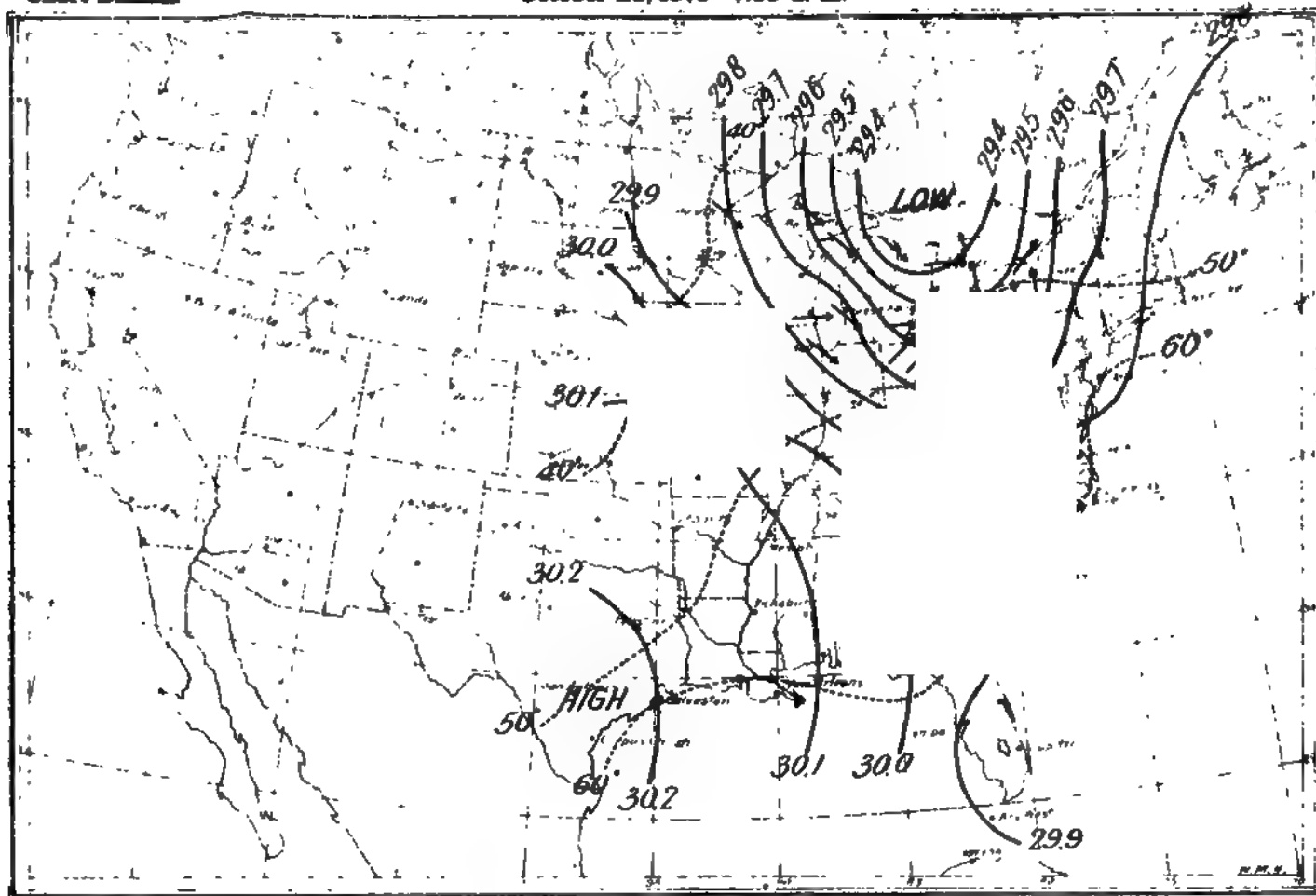
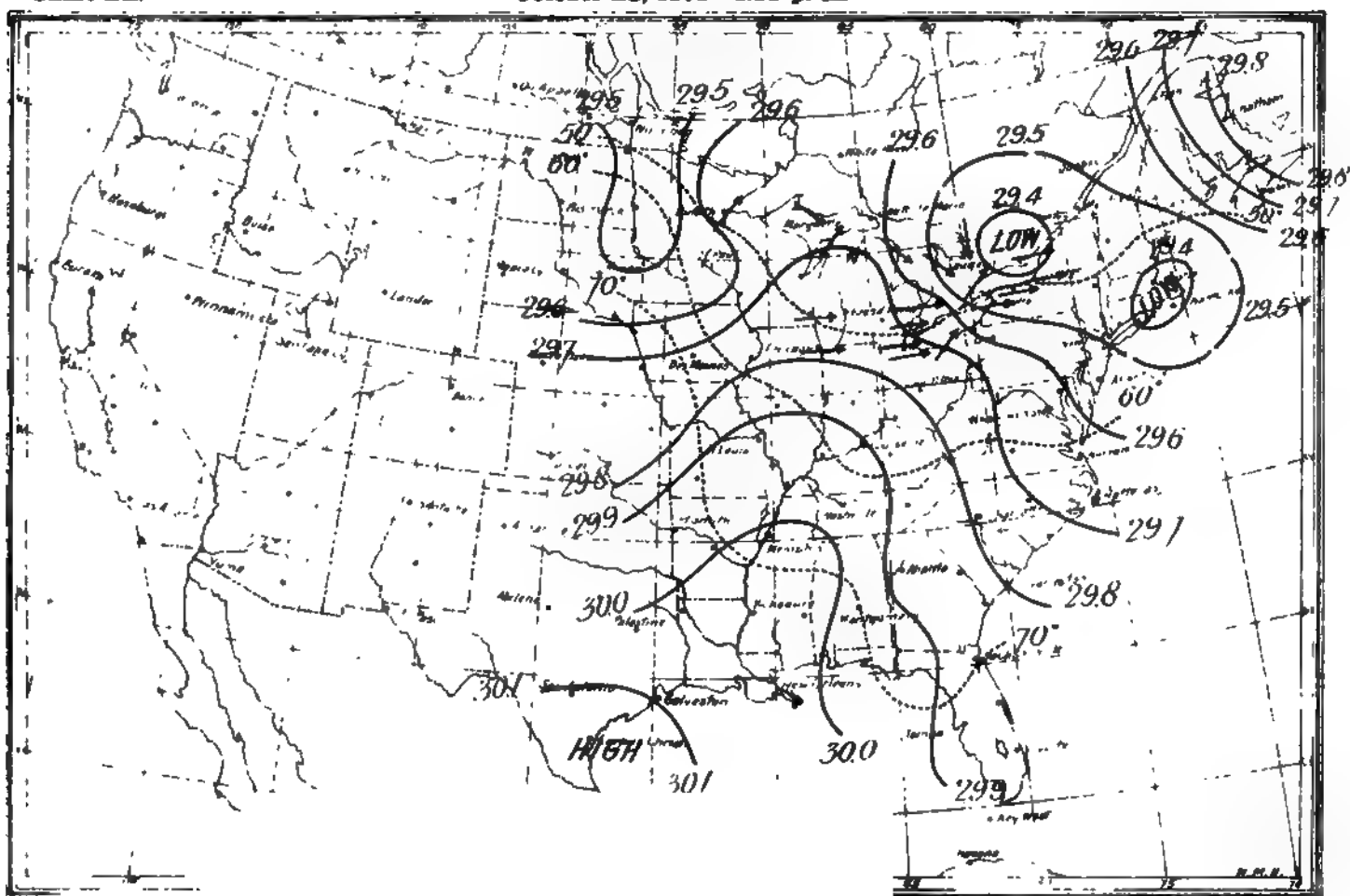


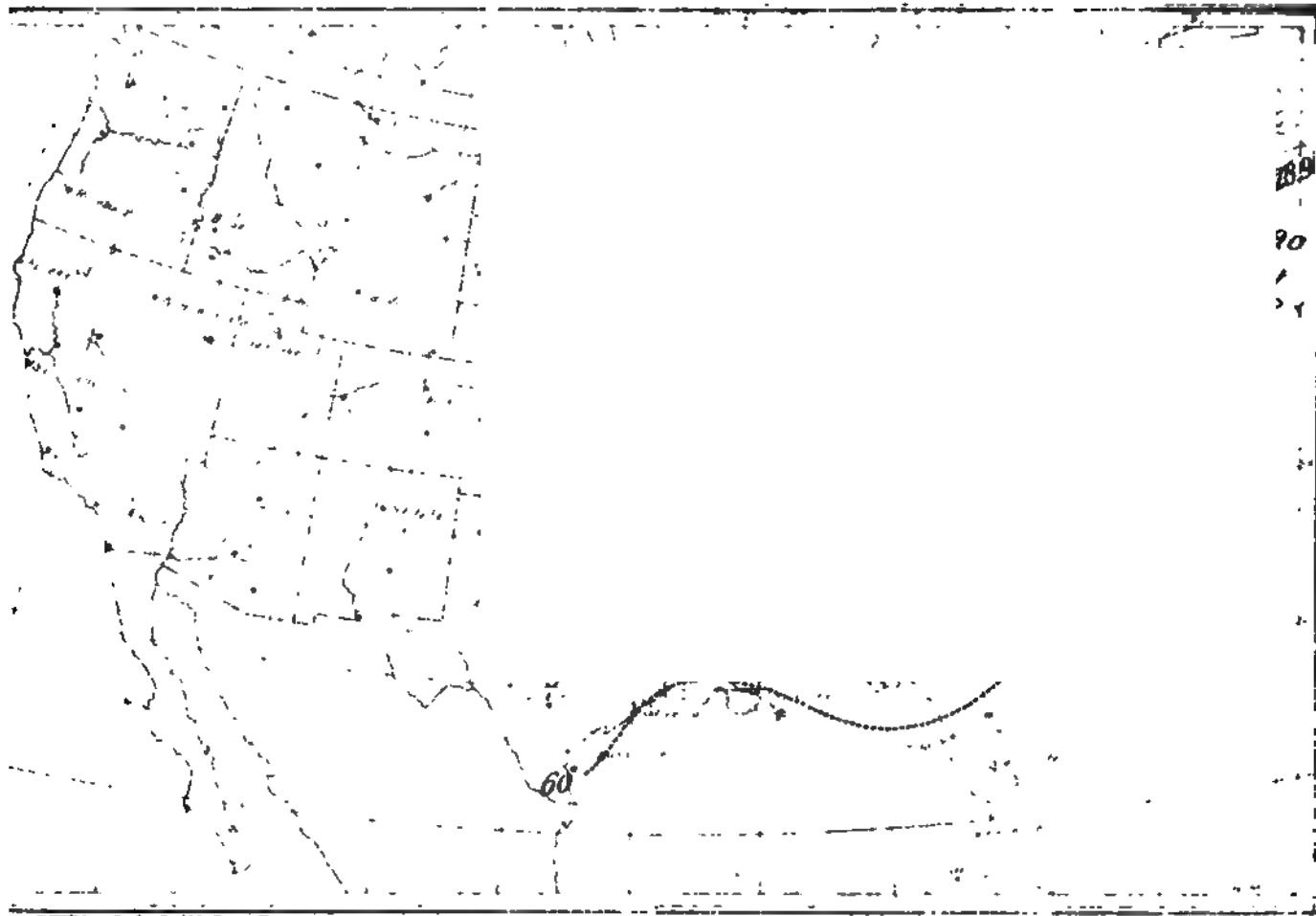
Chart DL.

October 28, 1870—4:35 p. m.



hart DLI.

October 29, 1879—7:35 a. m.



Part DLI.

October 20, 1879—4:35 p. m.

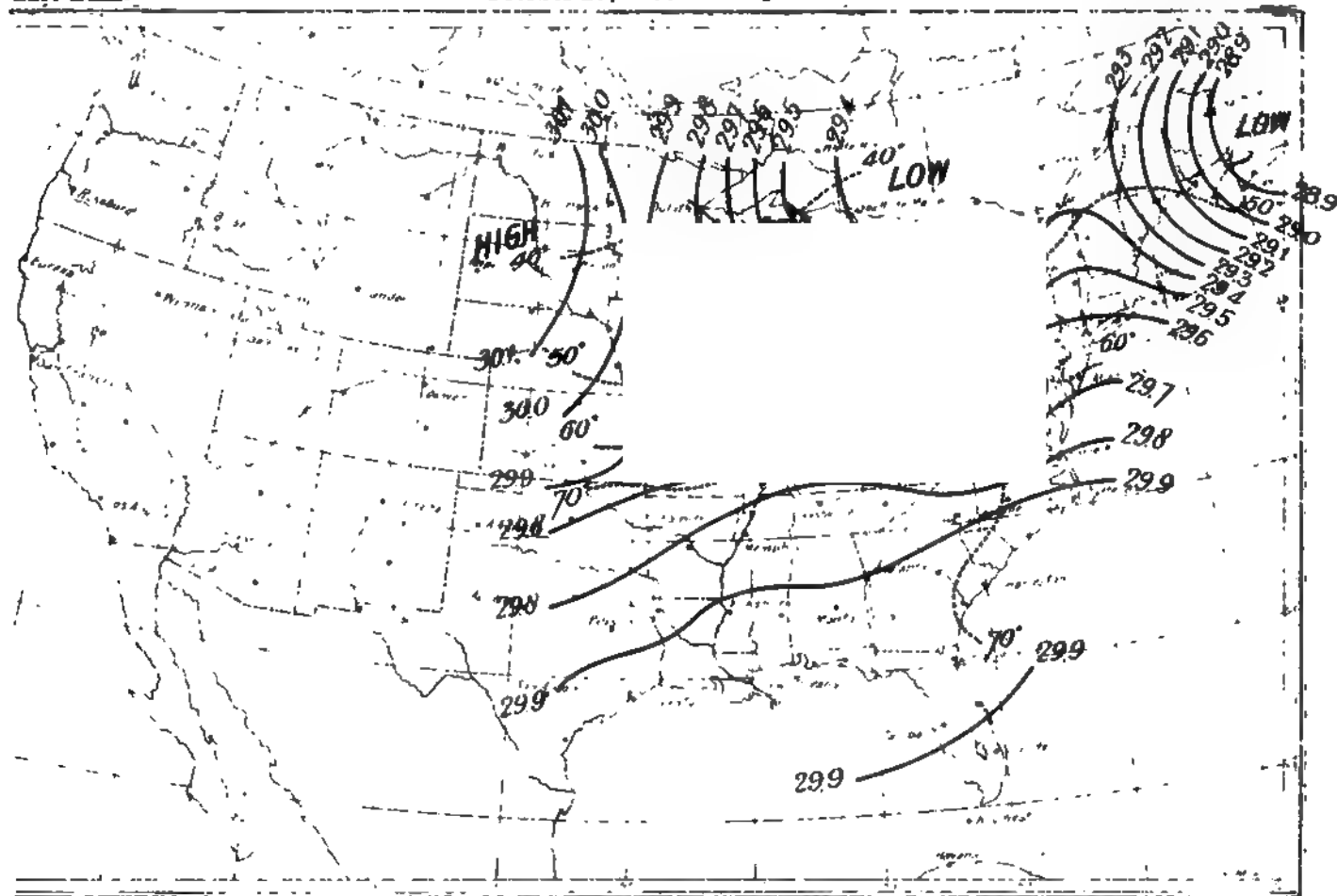


Chart DLIII.

October 15, 1880—8 p. m.

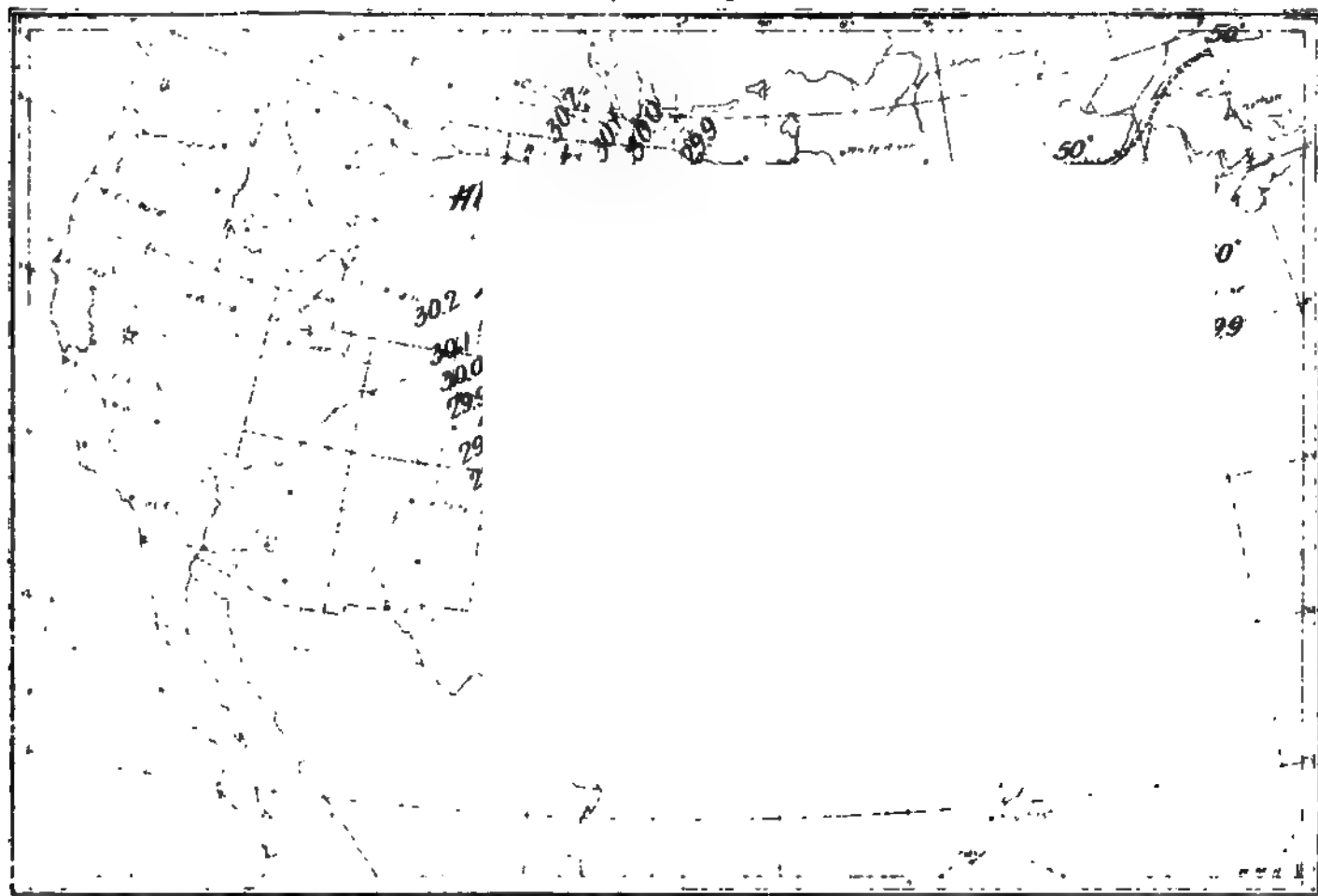
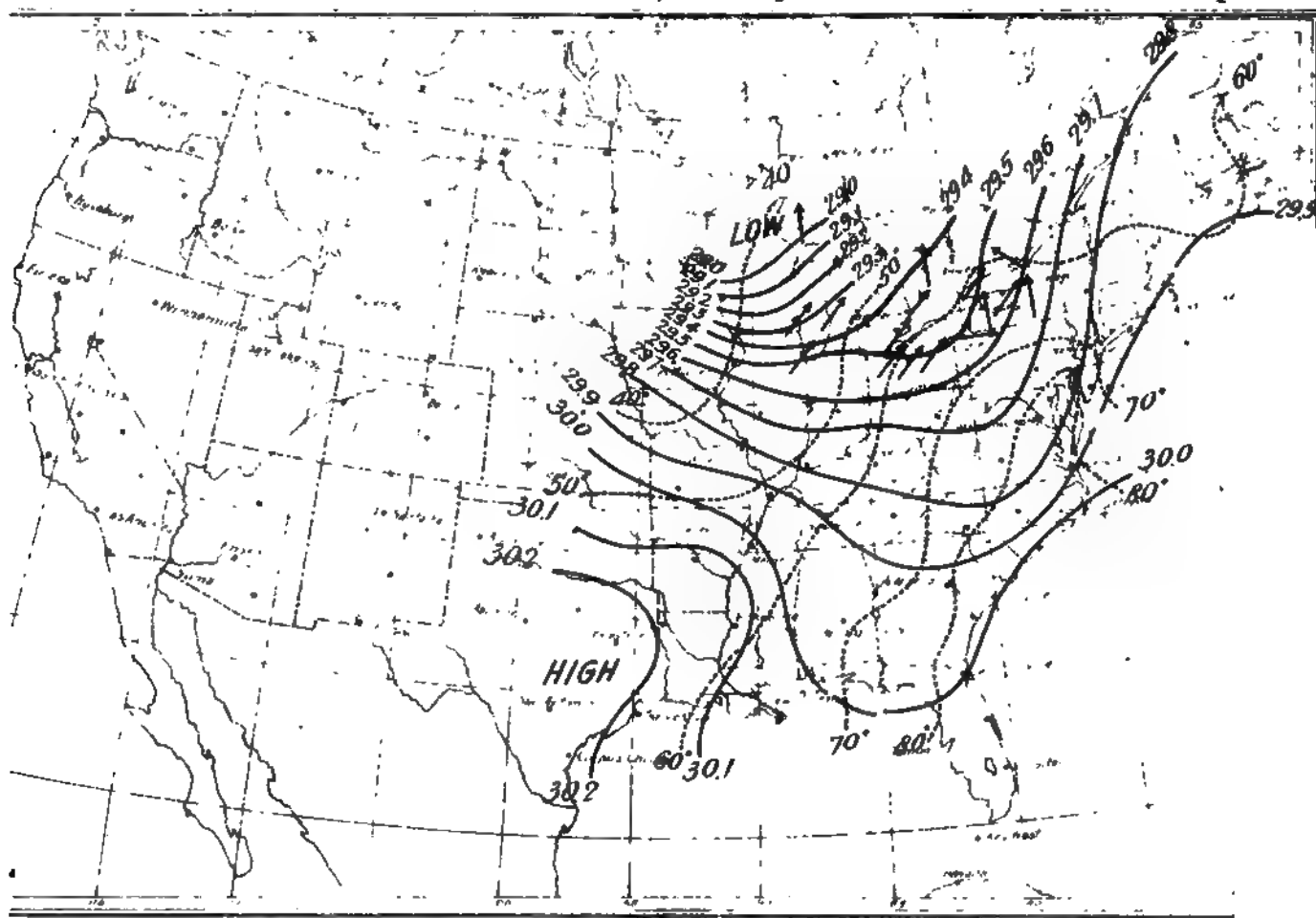


Chart DLIV.

October 16, 1880—7 a. m.

October 16, 1880—3 p. m.



October 17, 1880—7 a. m.

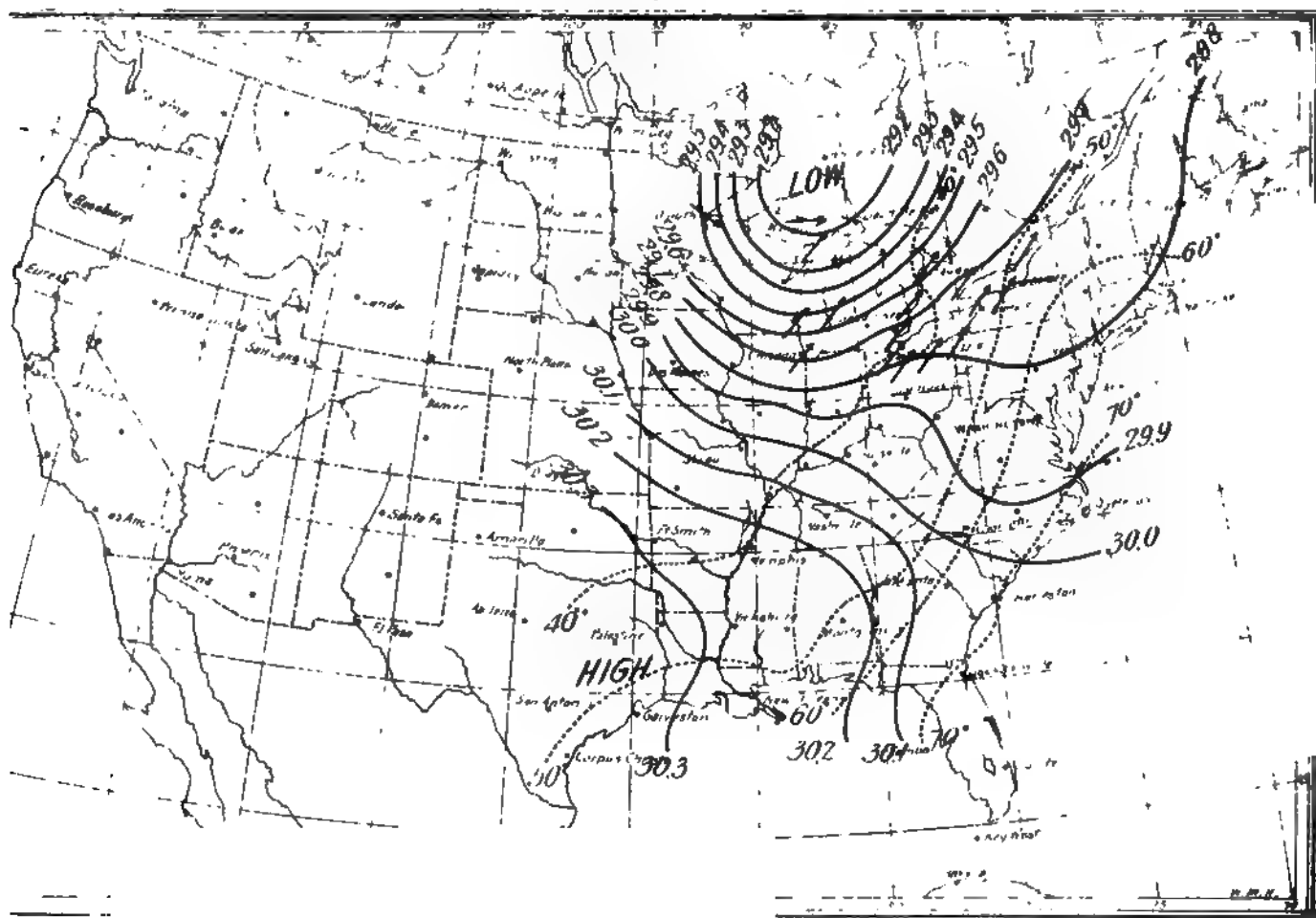


Chart DLVII.

October 11, 1881—7 a. m.

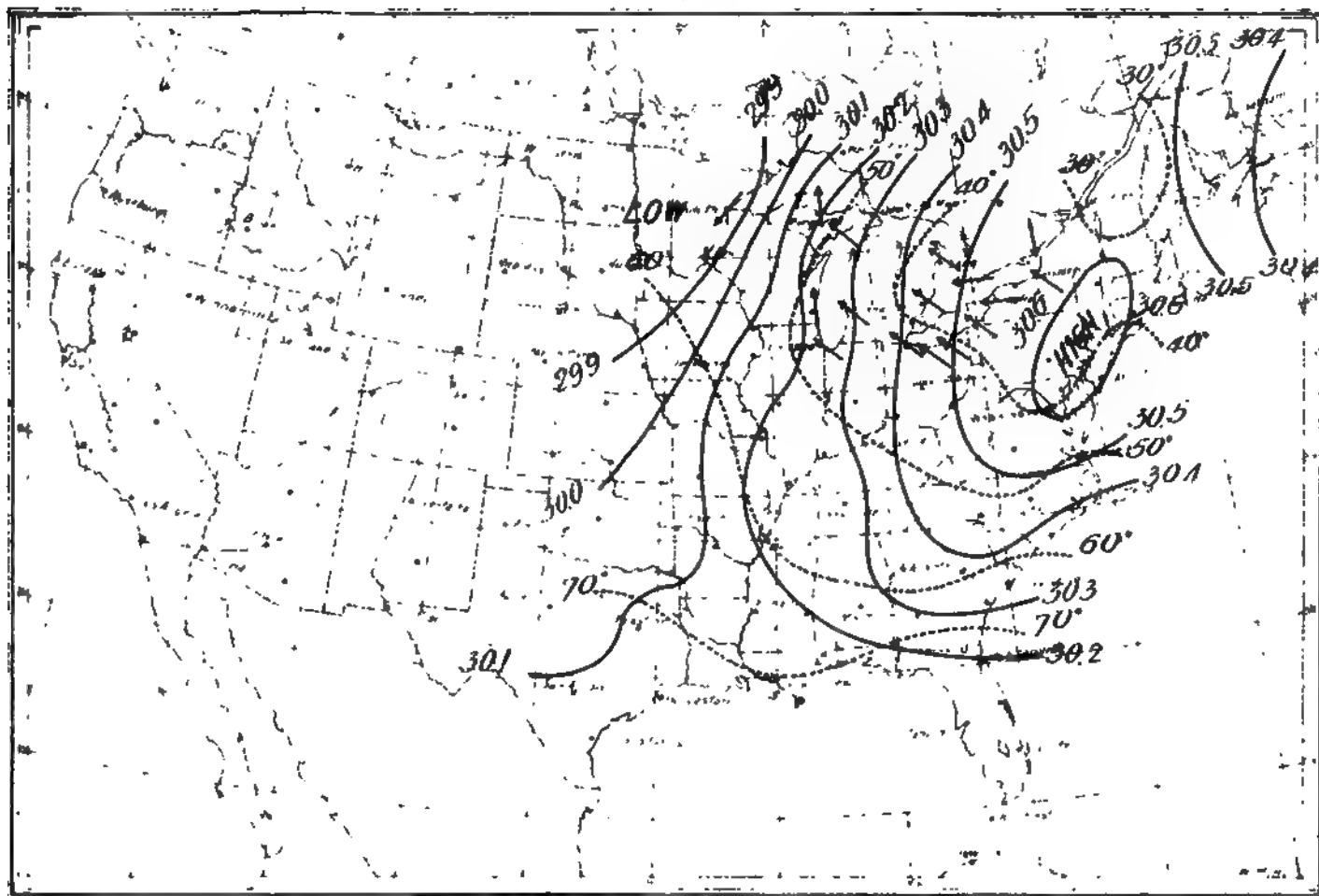


Chart DLVIII.

October 11, 1881—3 p. m.



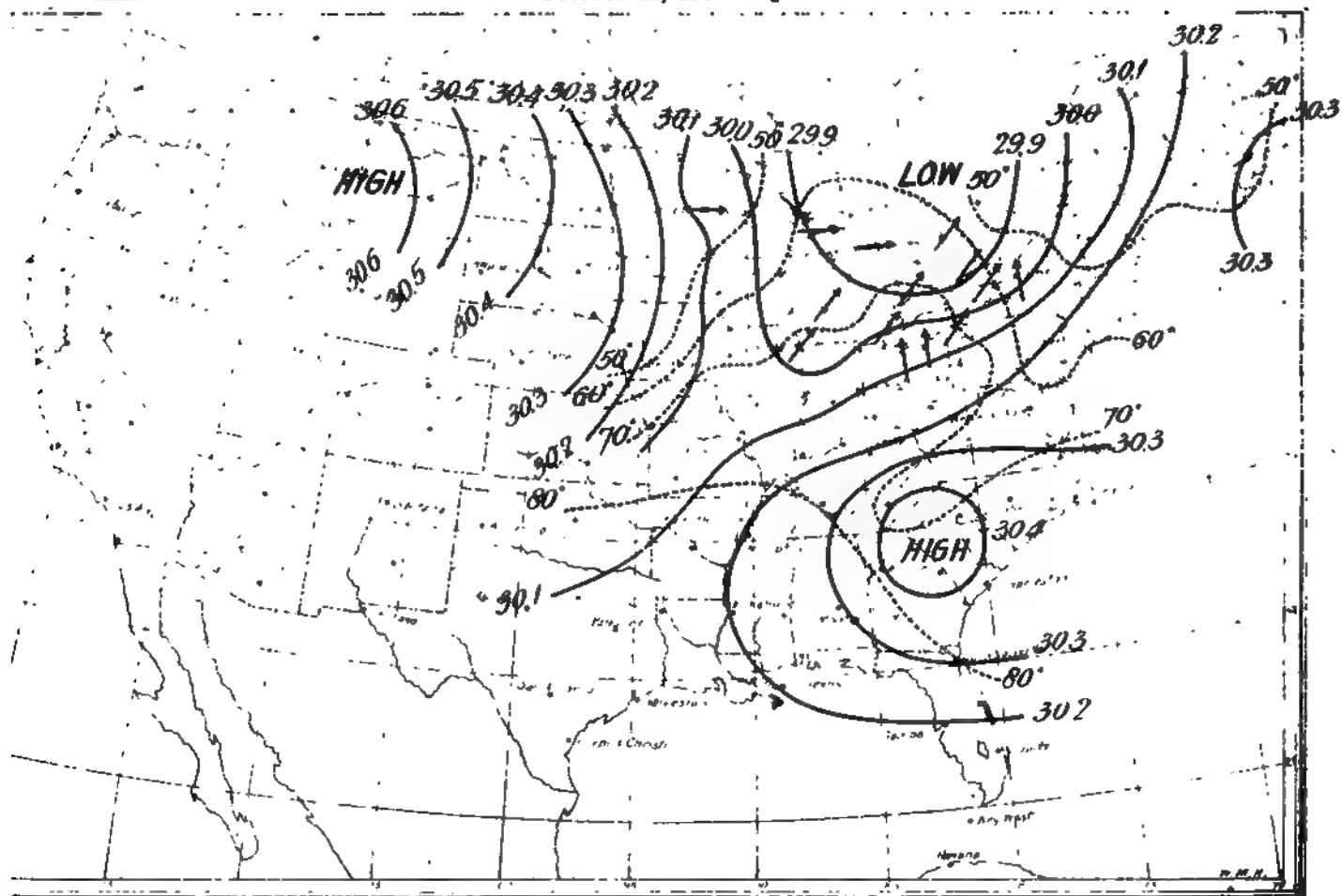
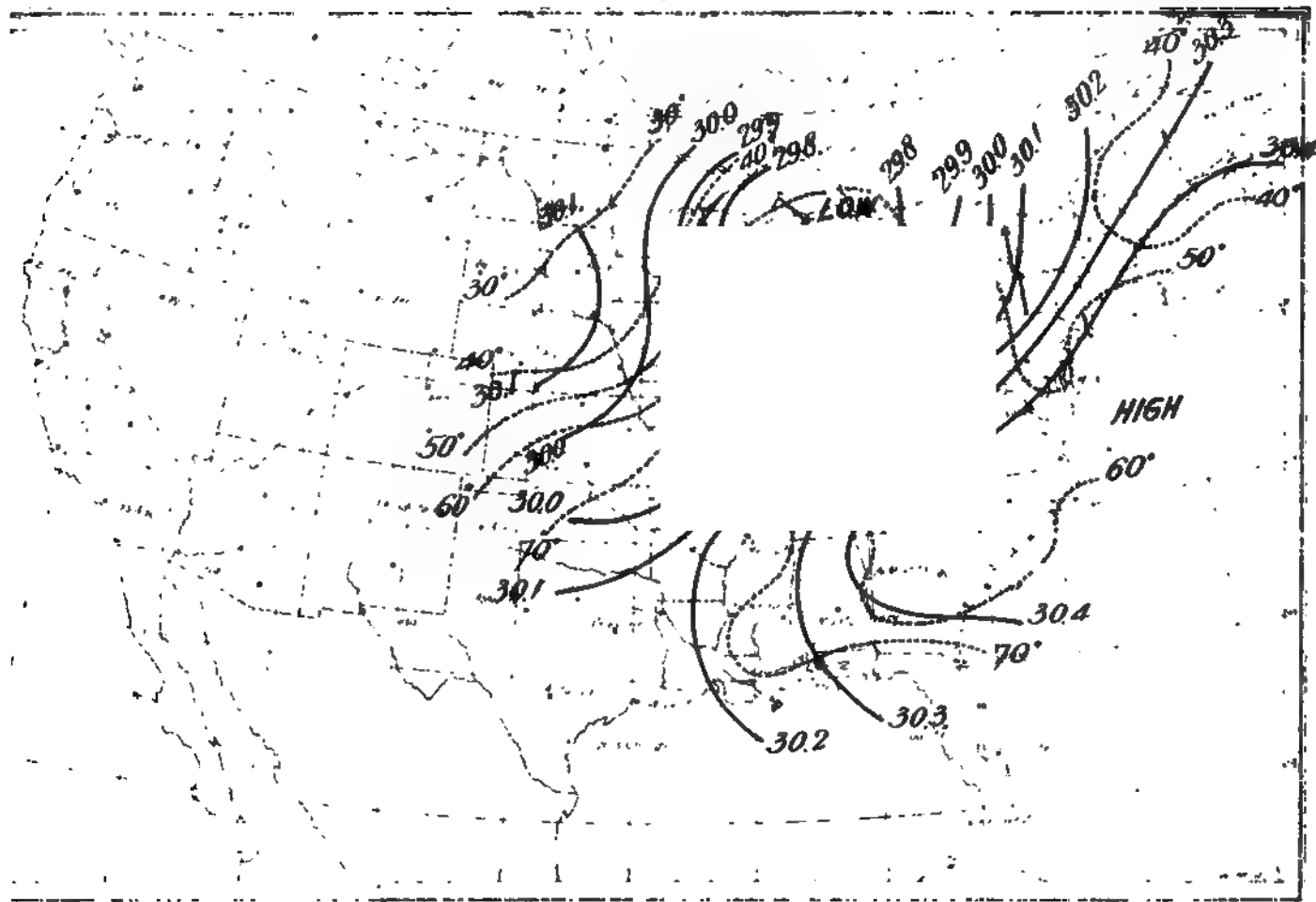


Chart DLXI

October 14, 1881—7 a. m.

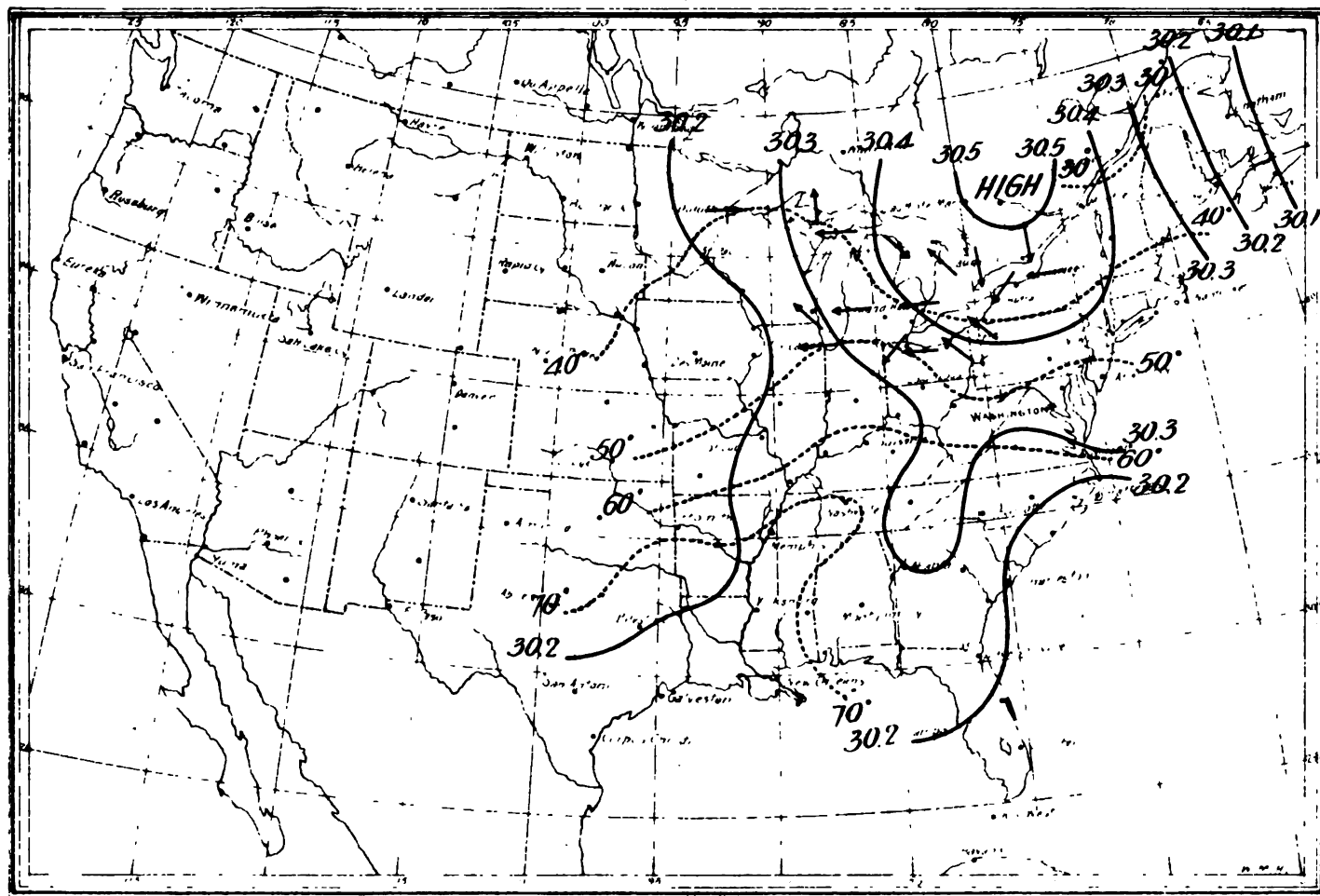
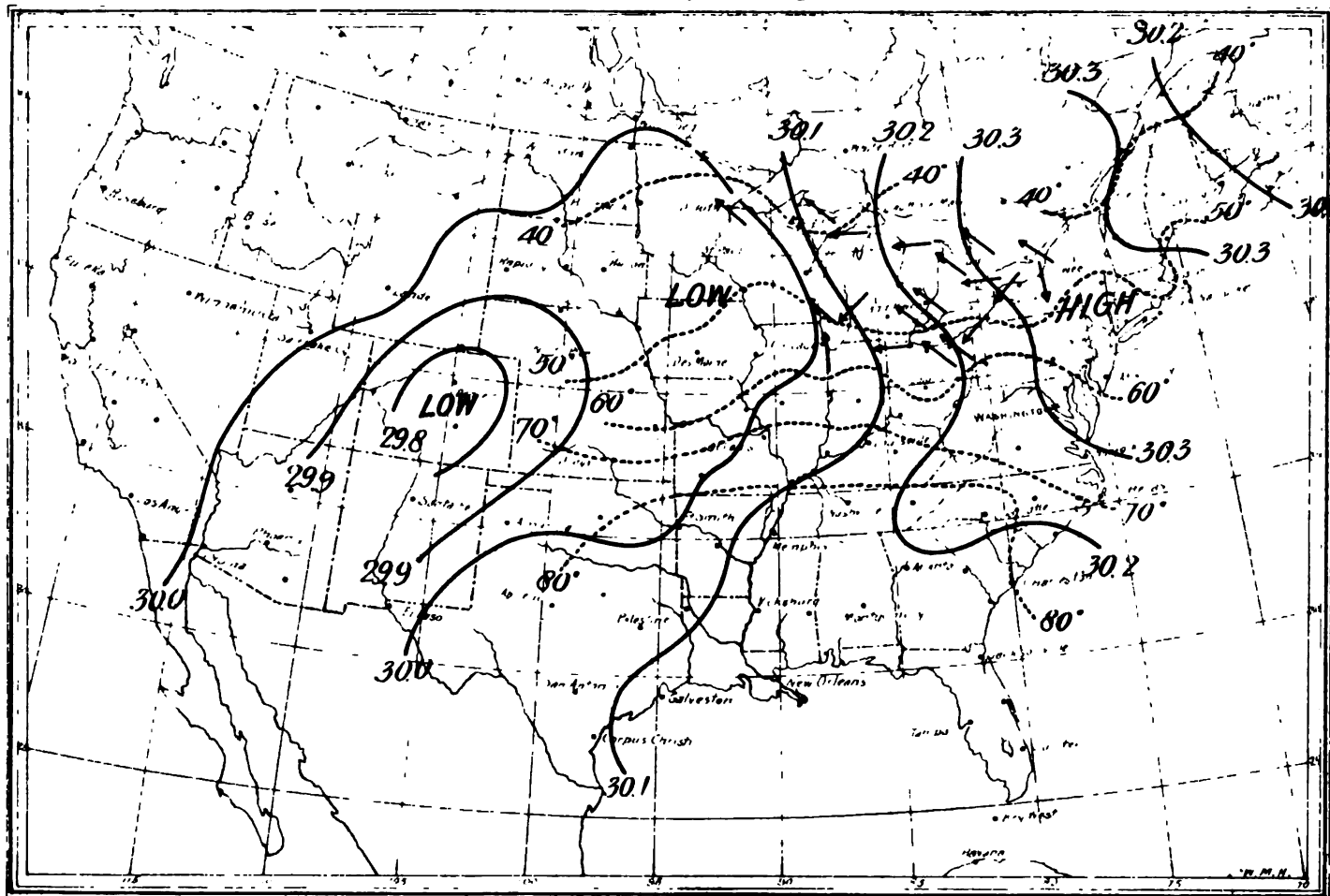


Chart DLXII

October 14, 1881—3 p. m.



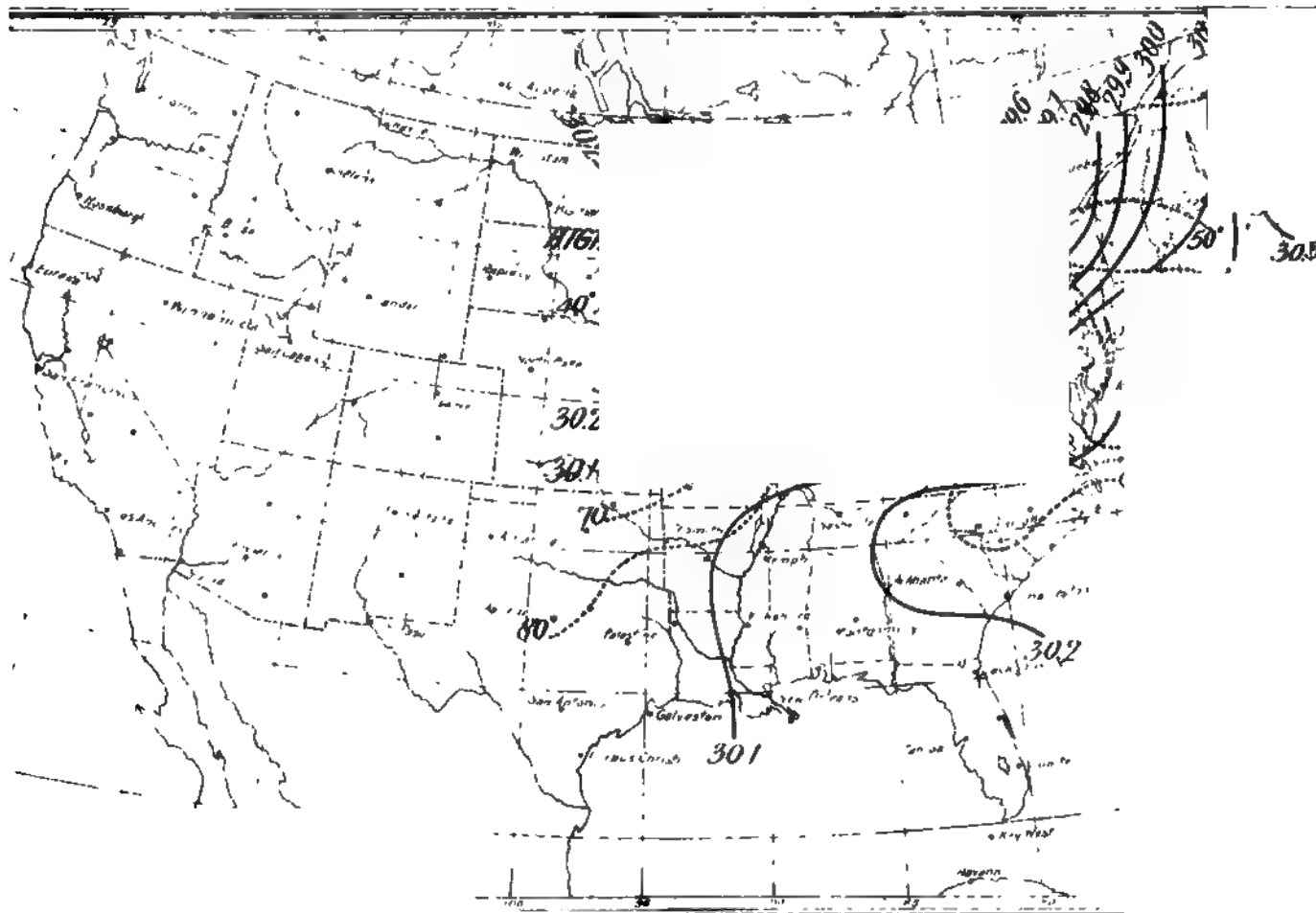
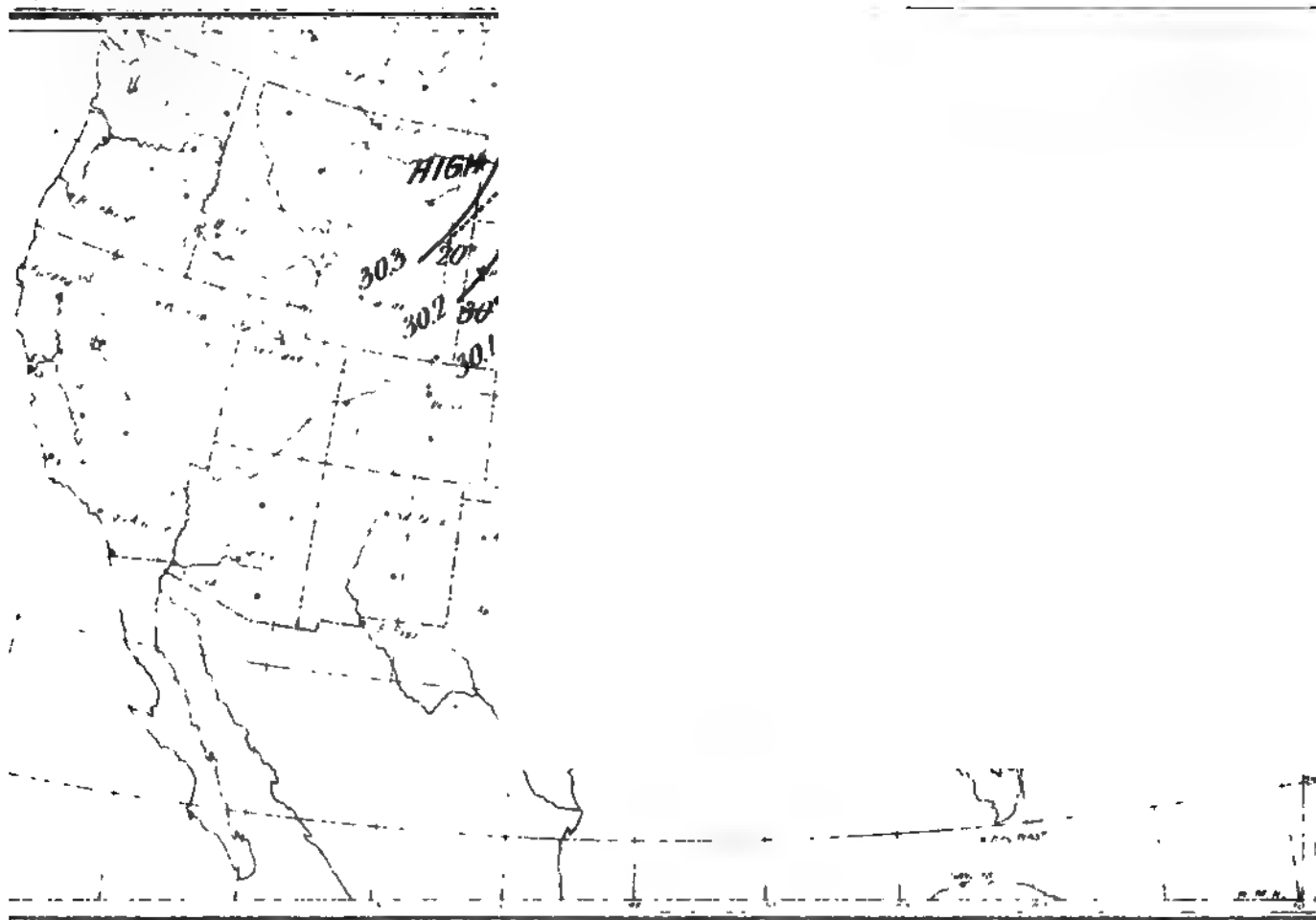


Chart DLXV.

October 8, 1882—7 a. m.

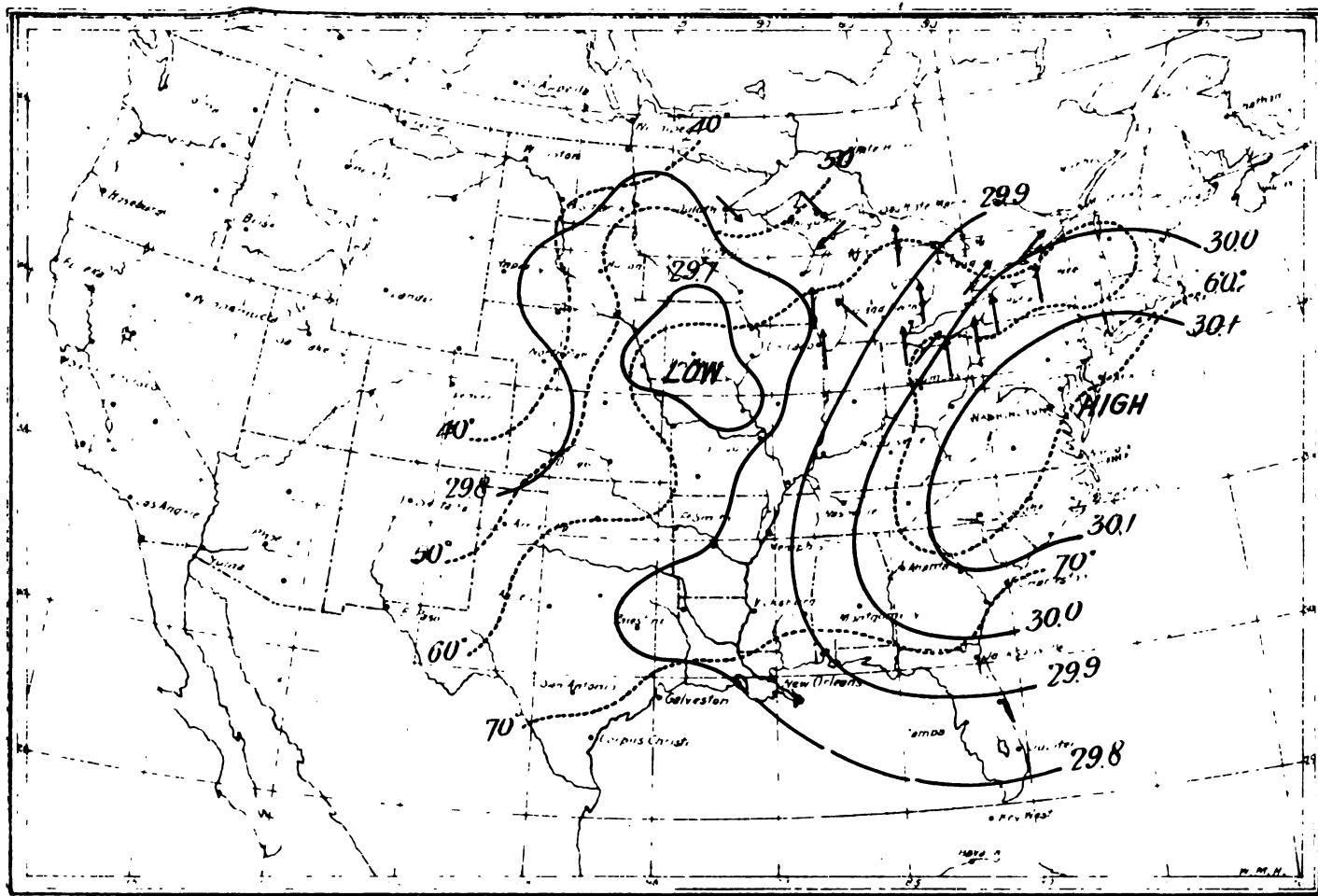


Chart DLXVI.

October 8, 1882—3 p. m.

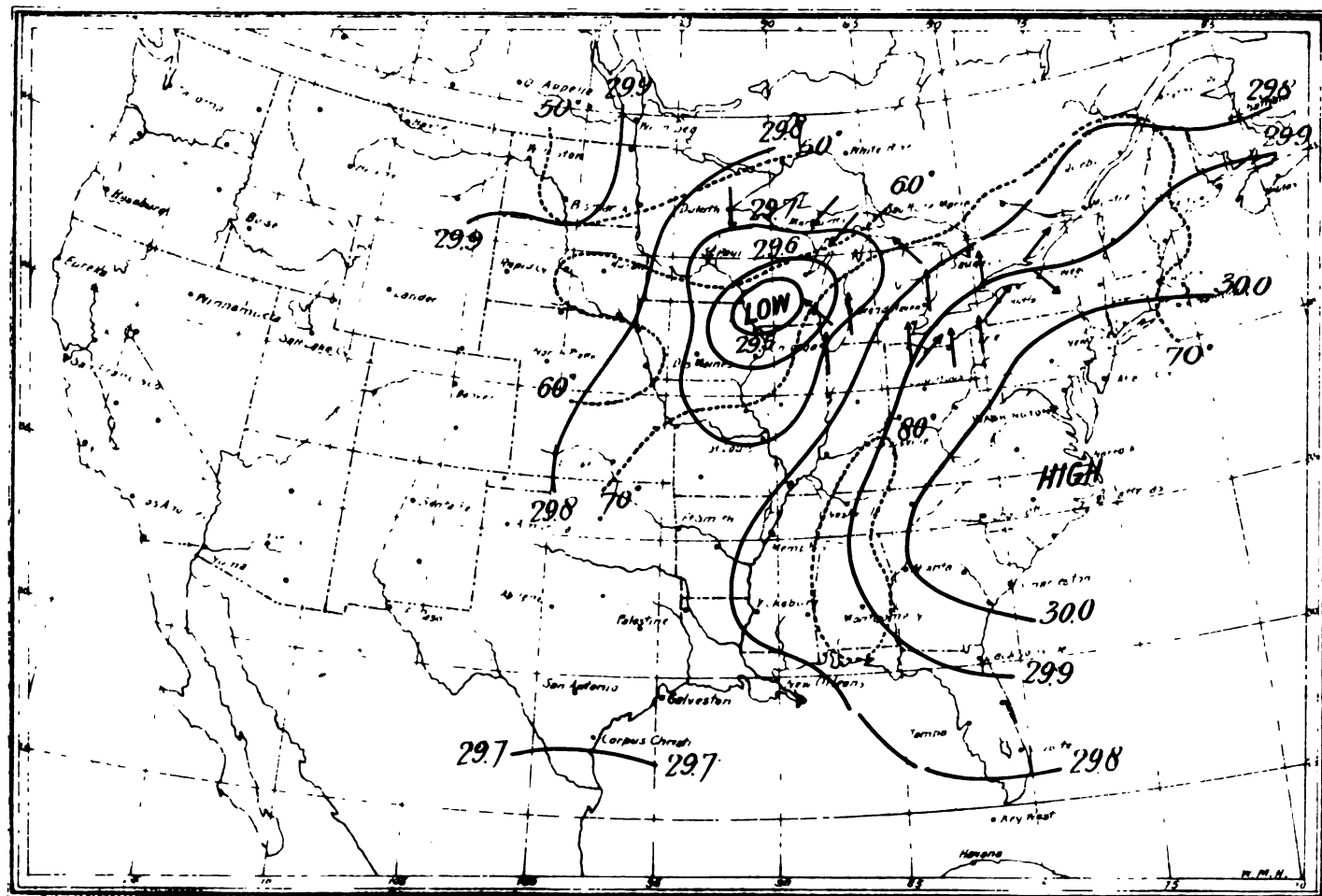


Chart DLXVII.

October 9, 1882—7 a. m.

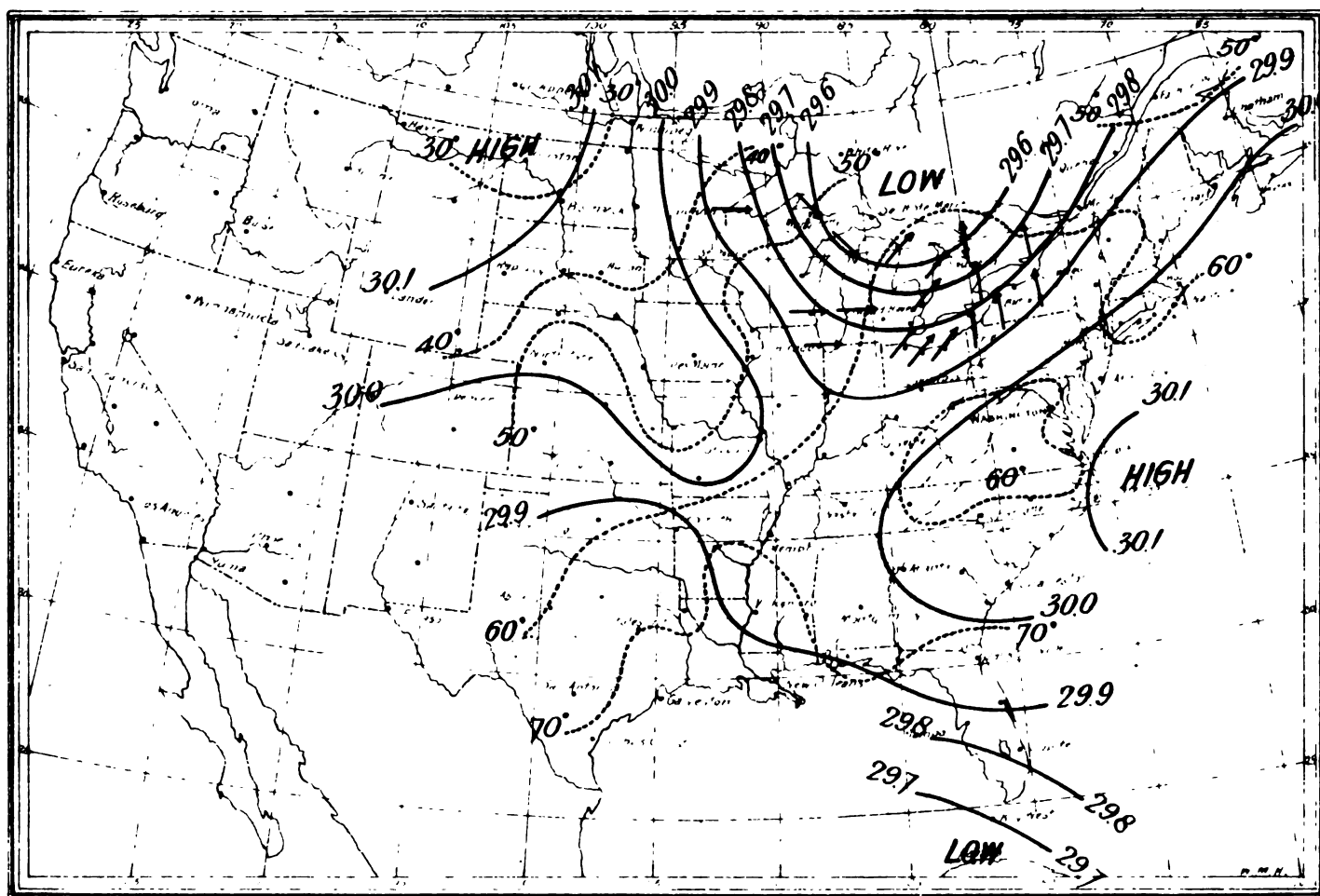


Chart DLXVIII.

October 9, 1882—3 p. m.

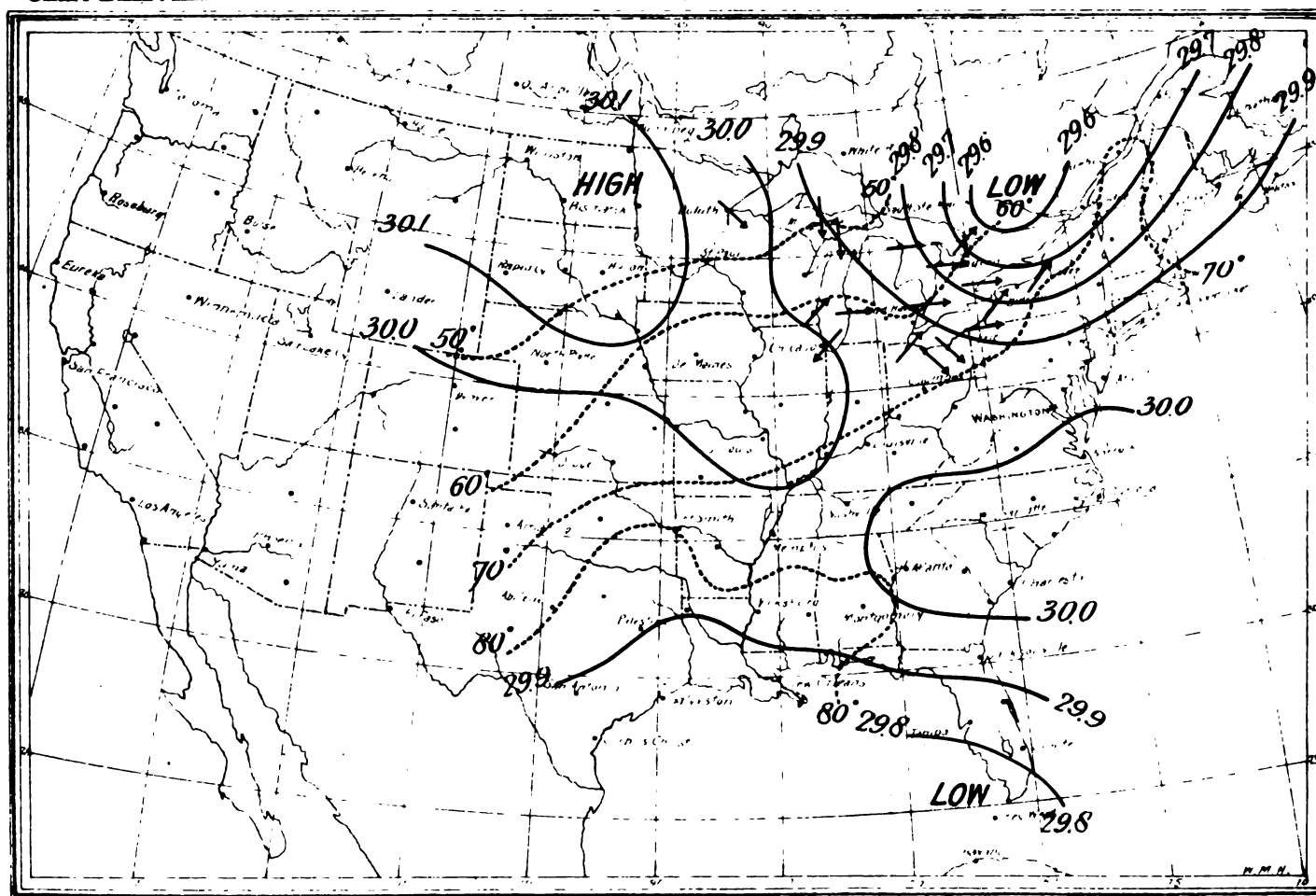


Chart DLXIX.

October 12, 1883—3 p. m.

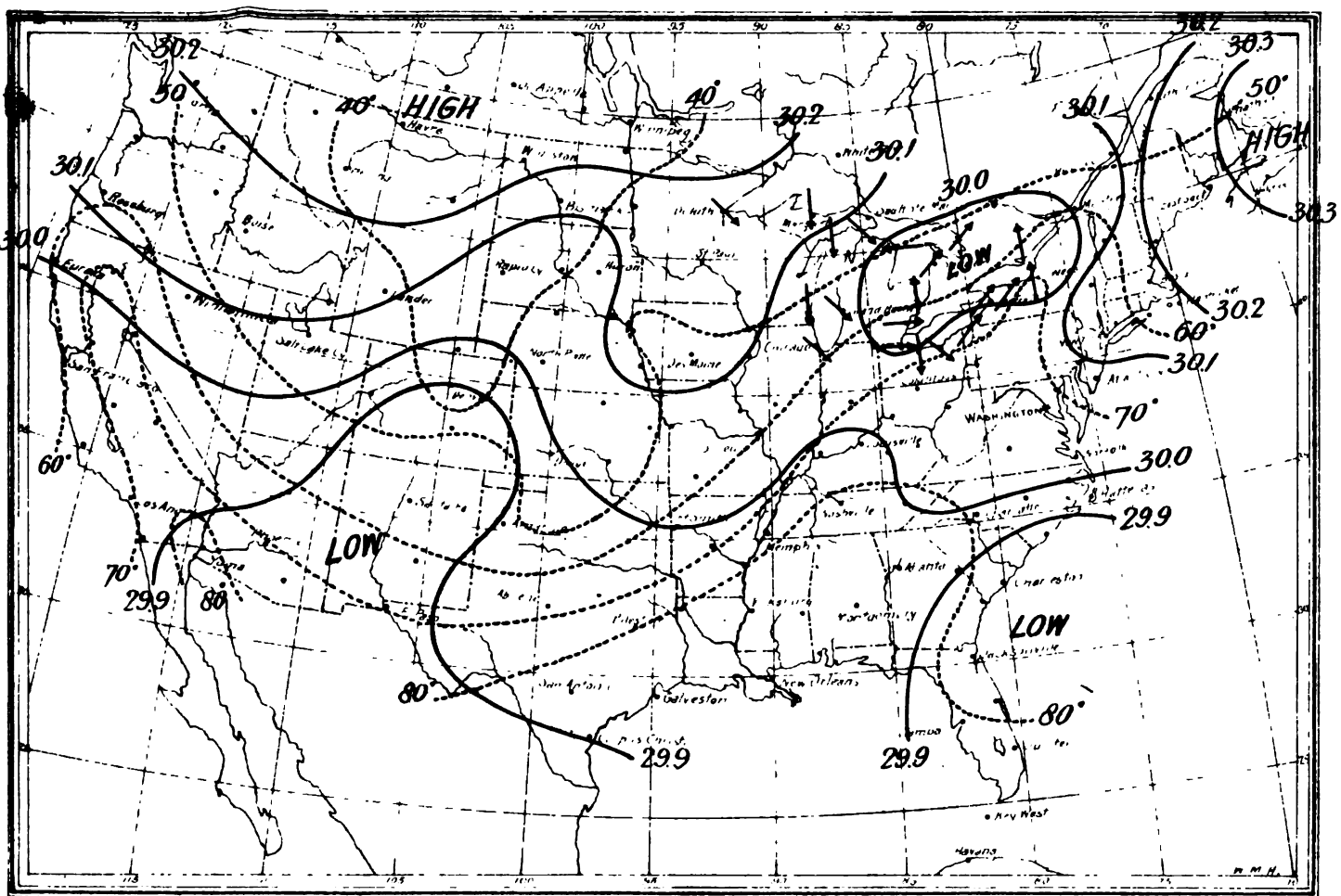
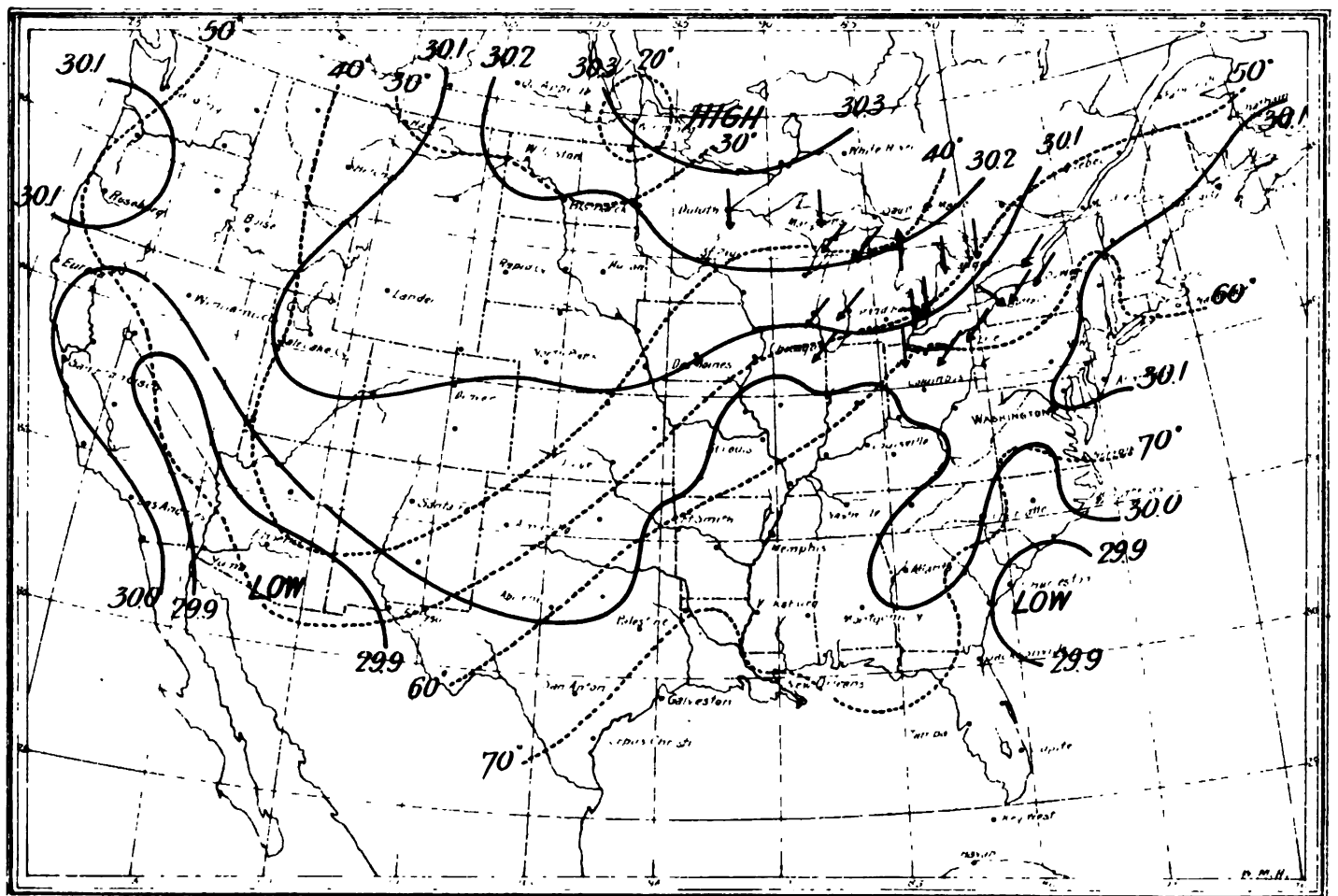


Chart DLXX.

October 13, 1883—7 a. m.



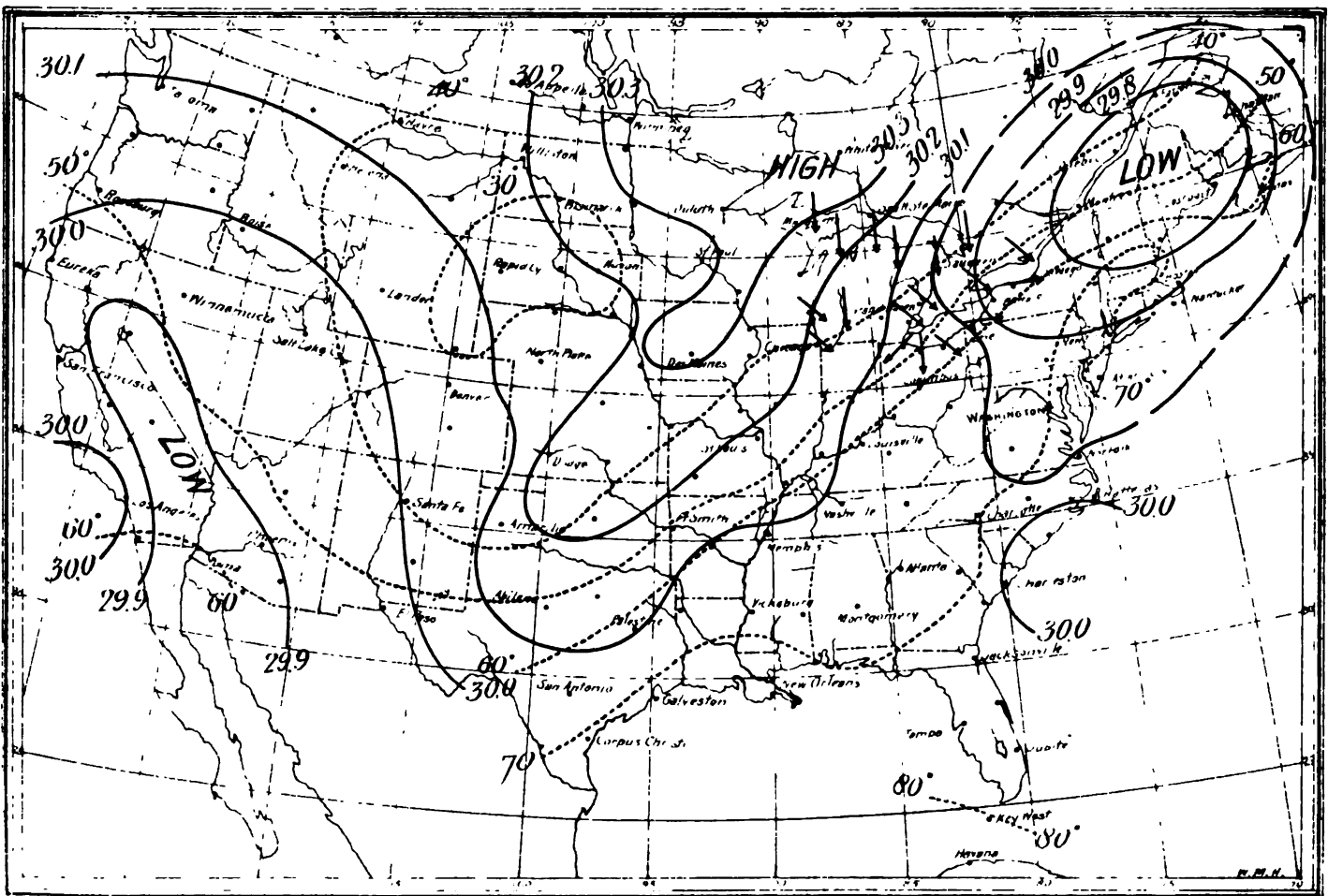
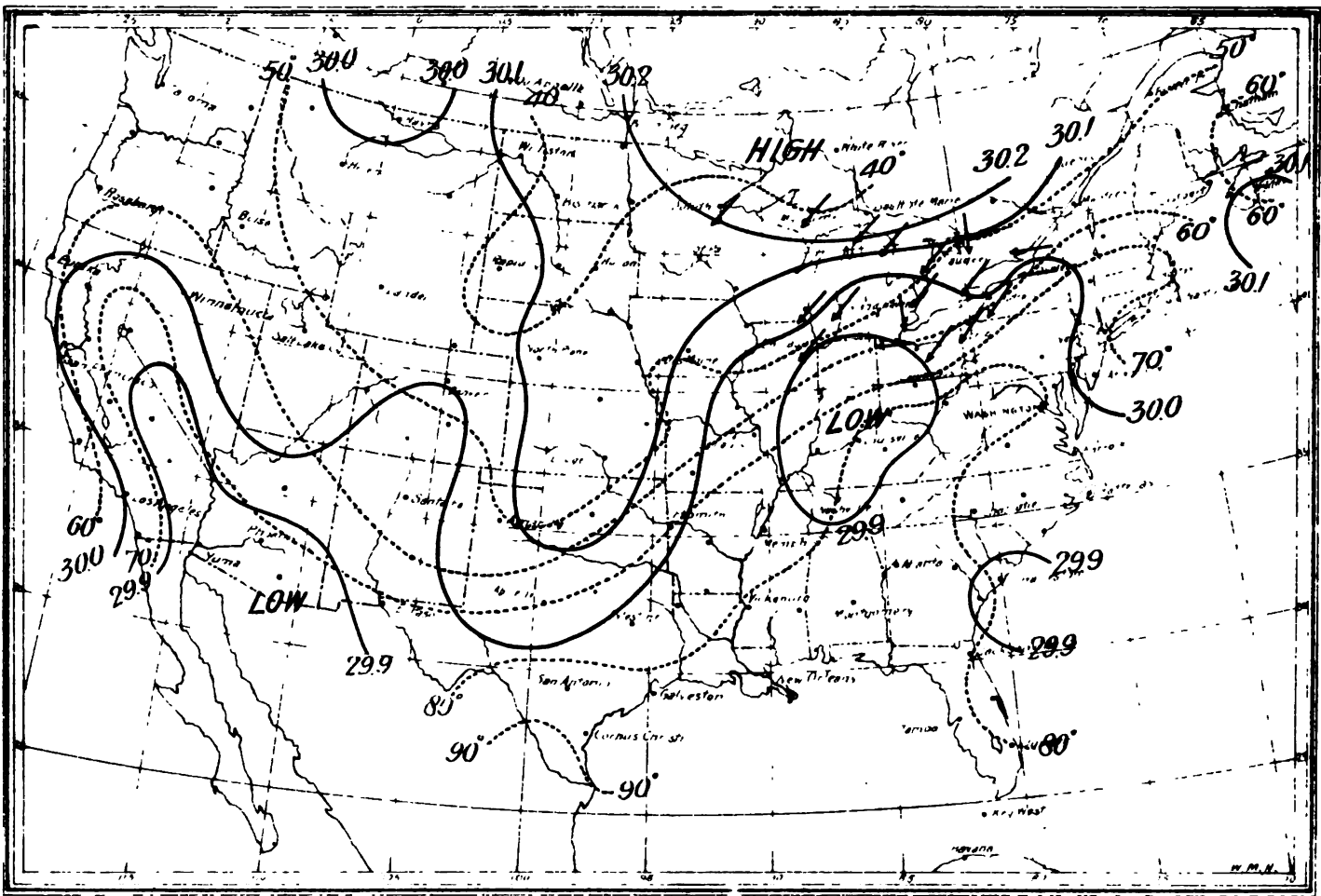


Chart DLXXIII.

October 26, 1888—7 a. m.

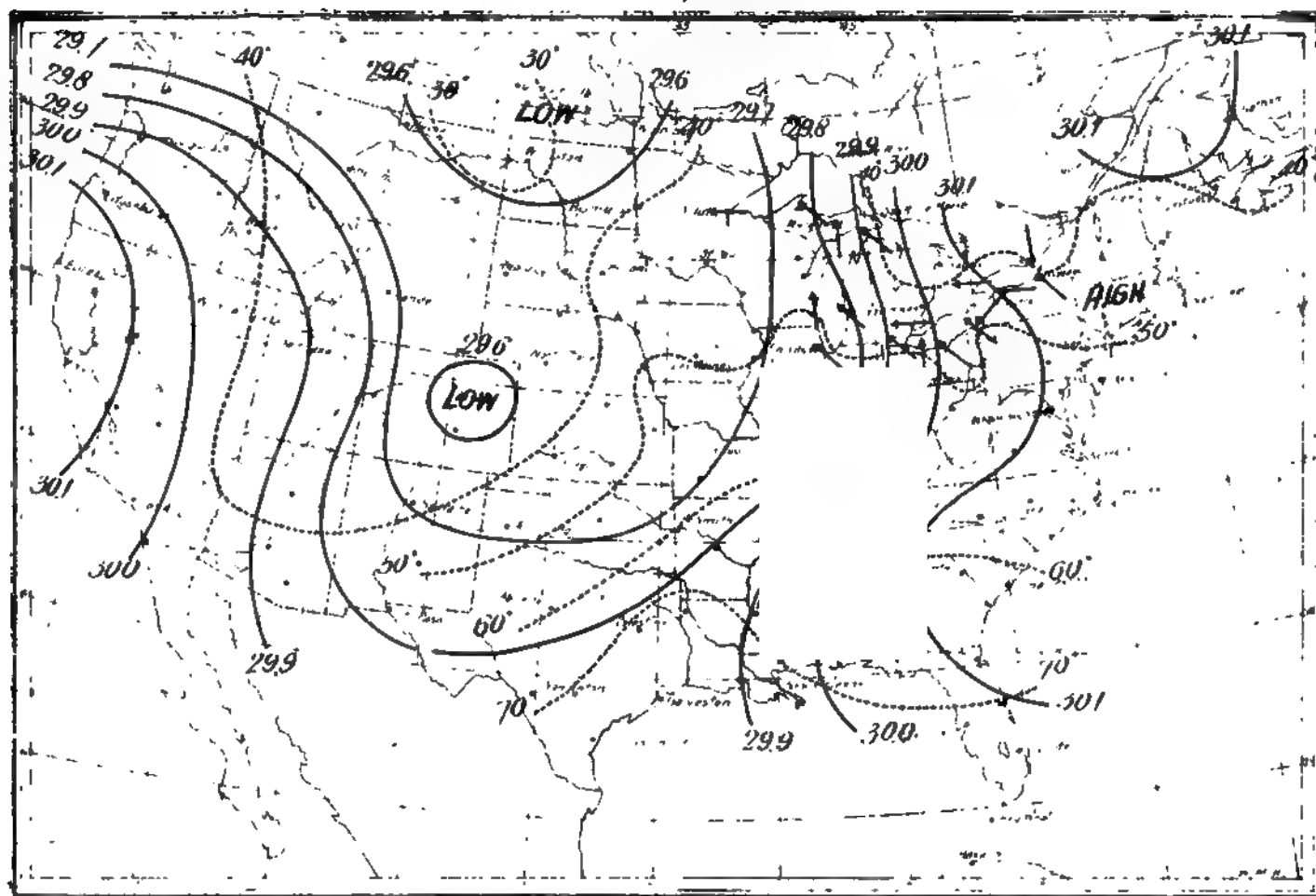
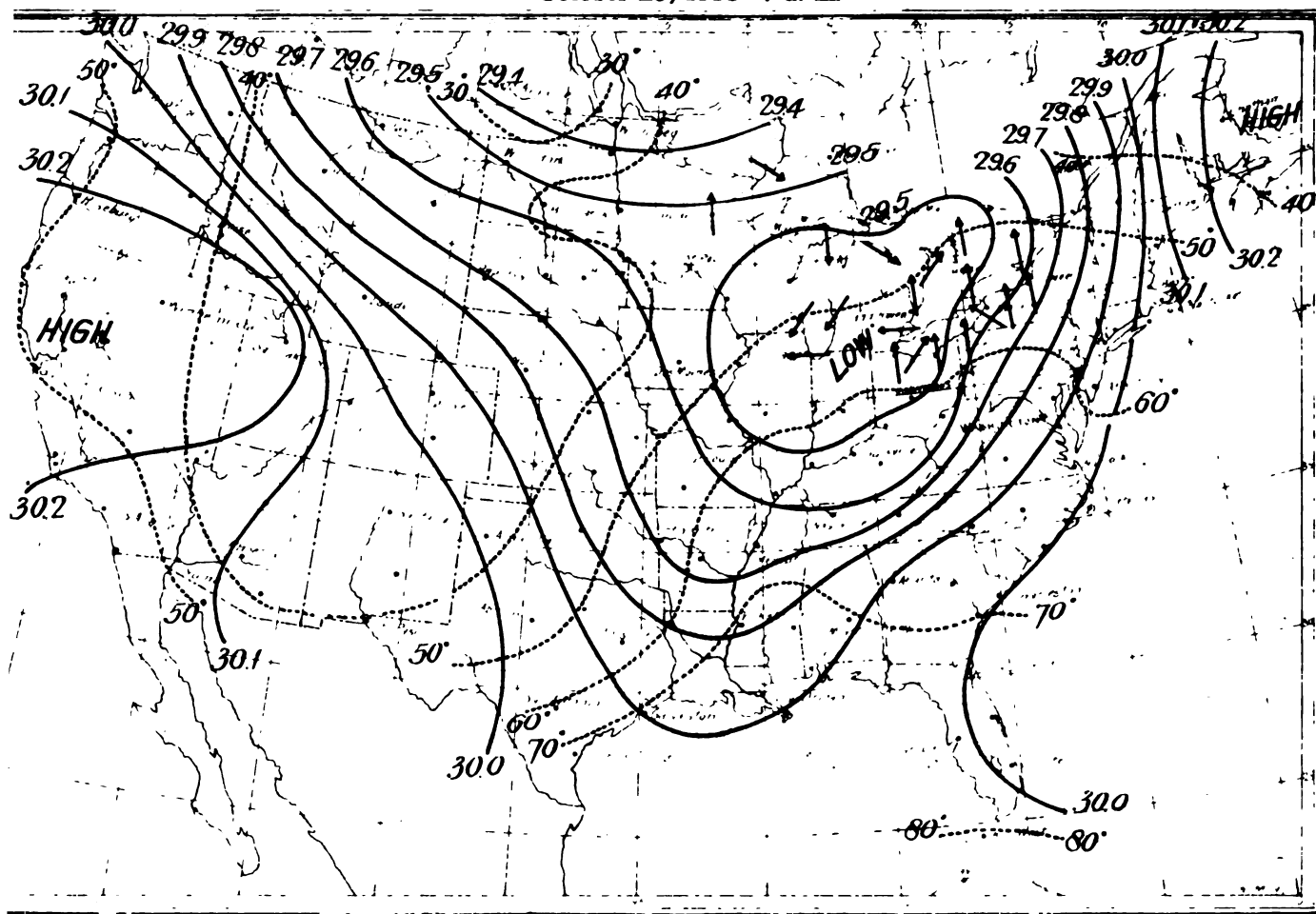


Chart DLXXIV.

October 26, 1888—3 p. m.

October 29, 1883—7 a. m.



October 29, 1883—3 p. m.

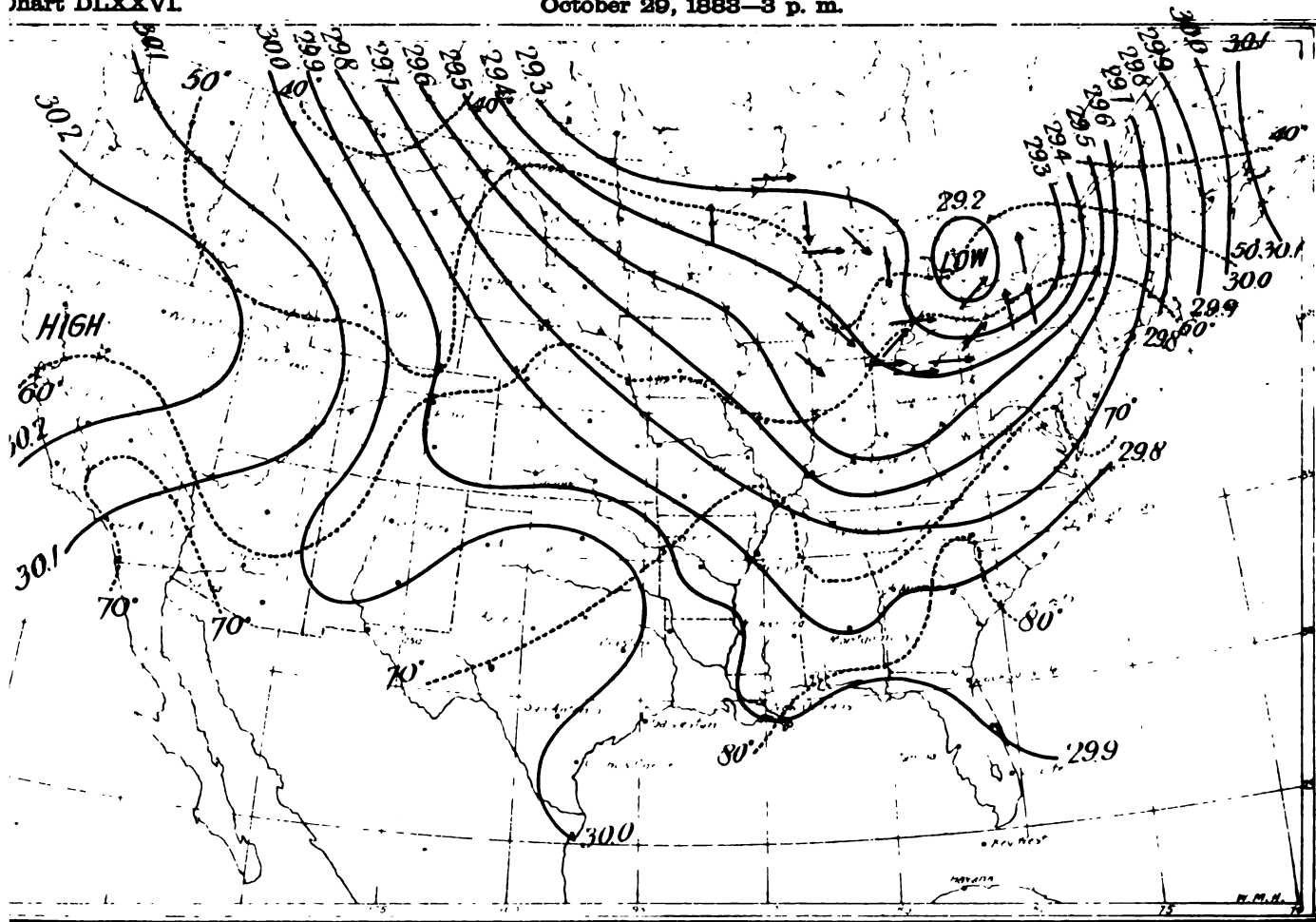


Chart DLXXVII.

October 7, 1884—7 a. m.

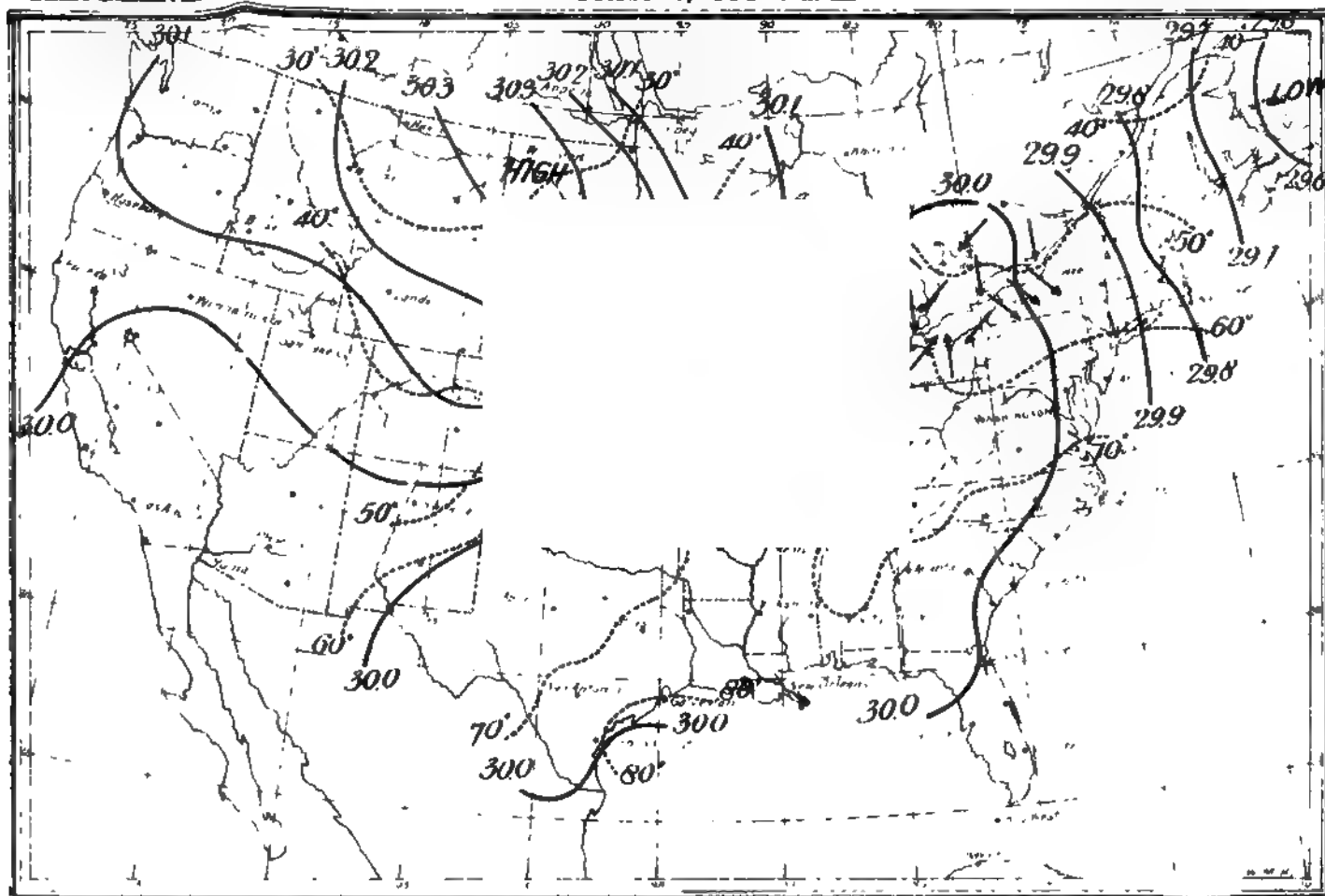


Chart DLXXVIII.

October 7, 1884—3 p. m.

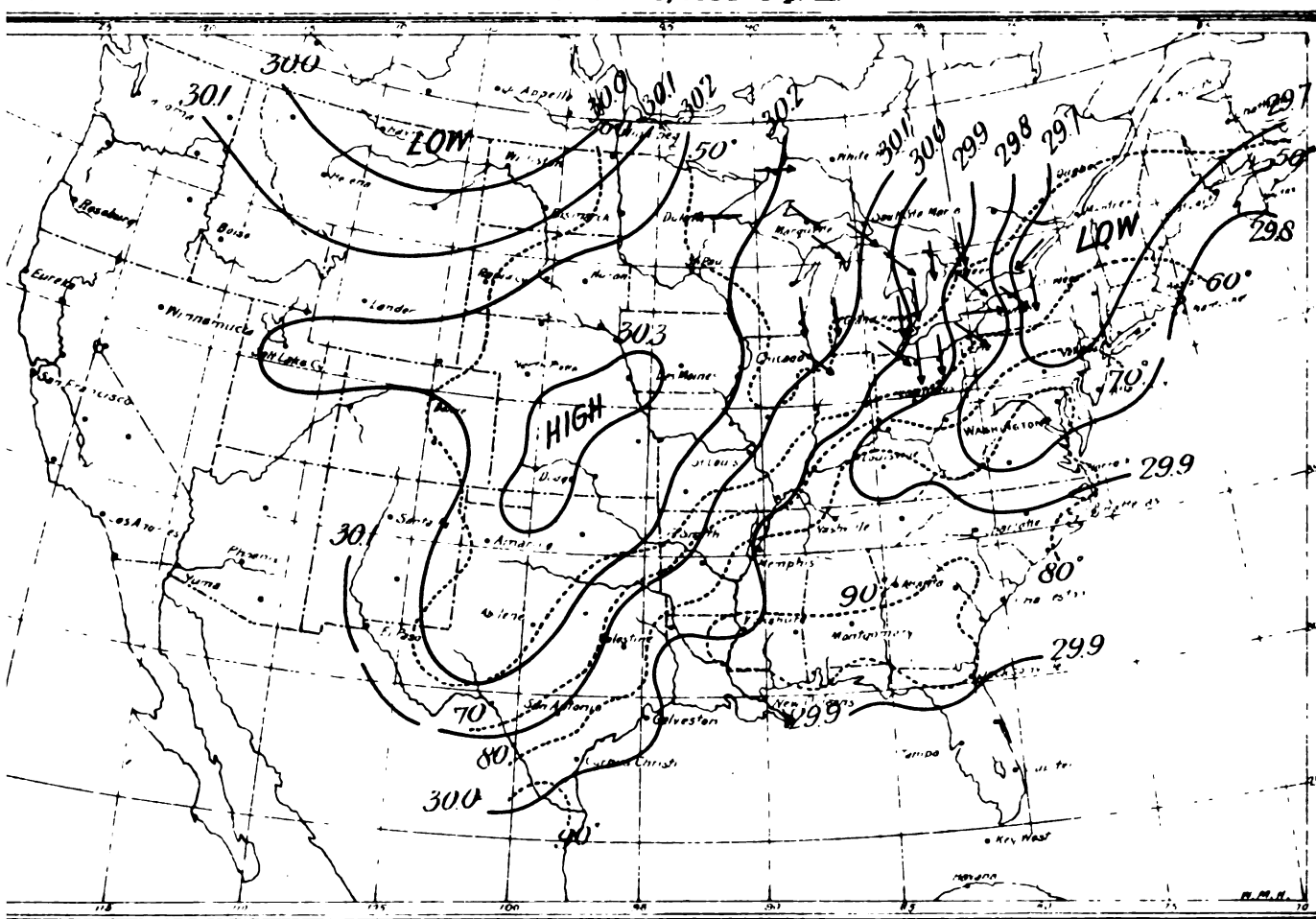
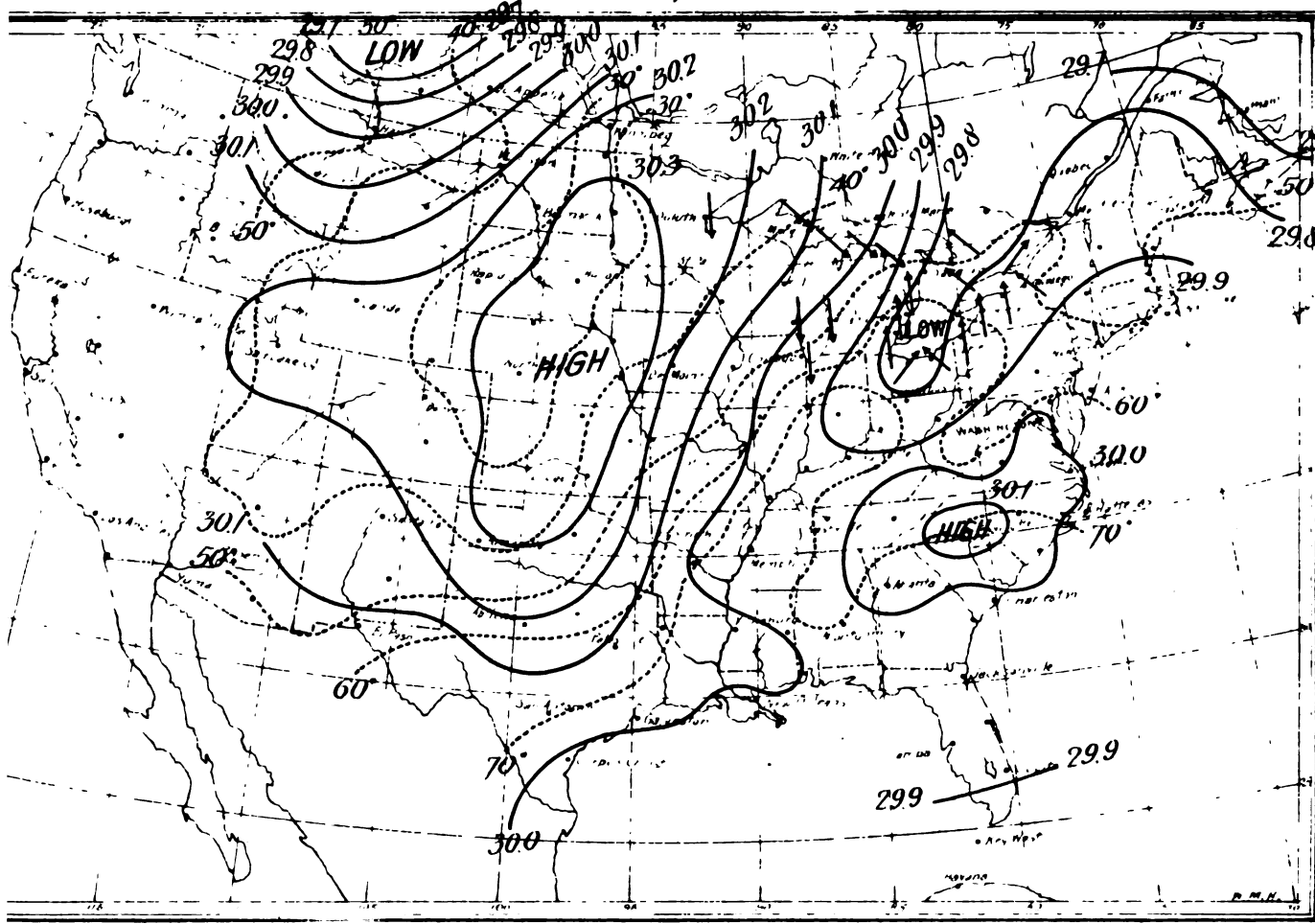


Chart DLXXXI.

October 20, 1884—7 a. m.

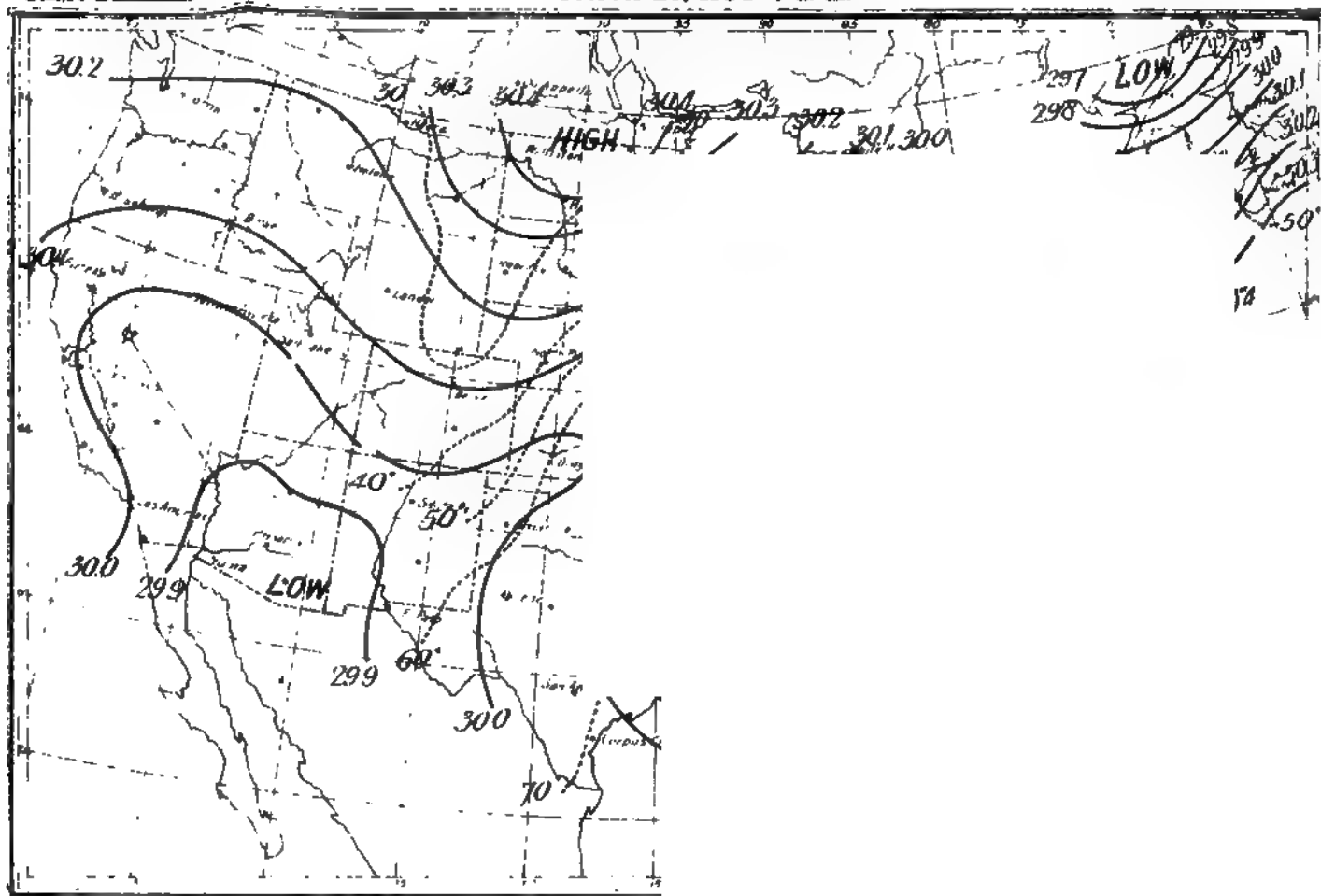
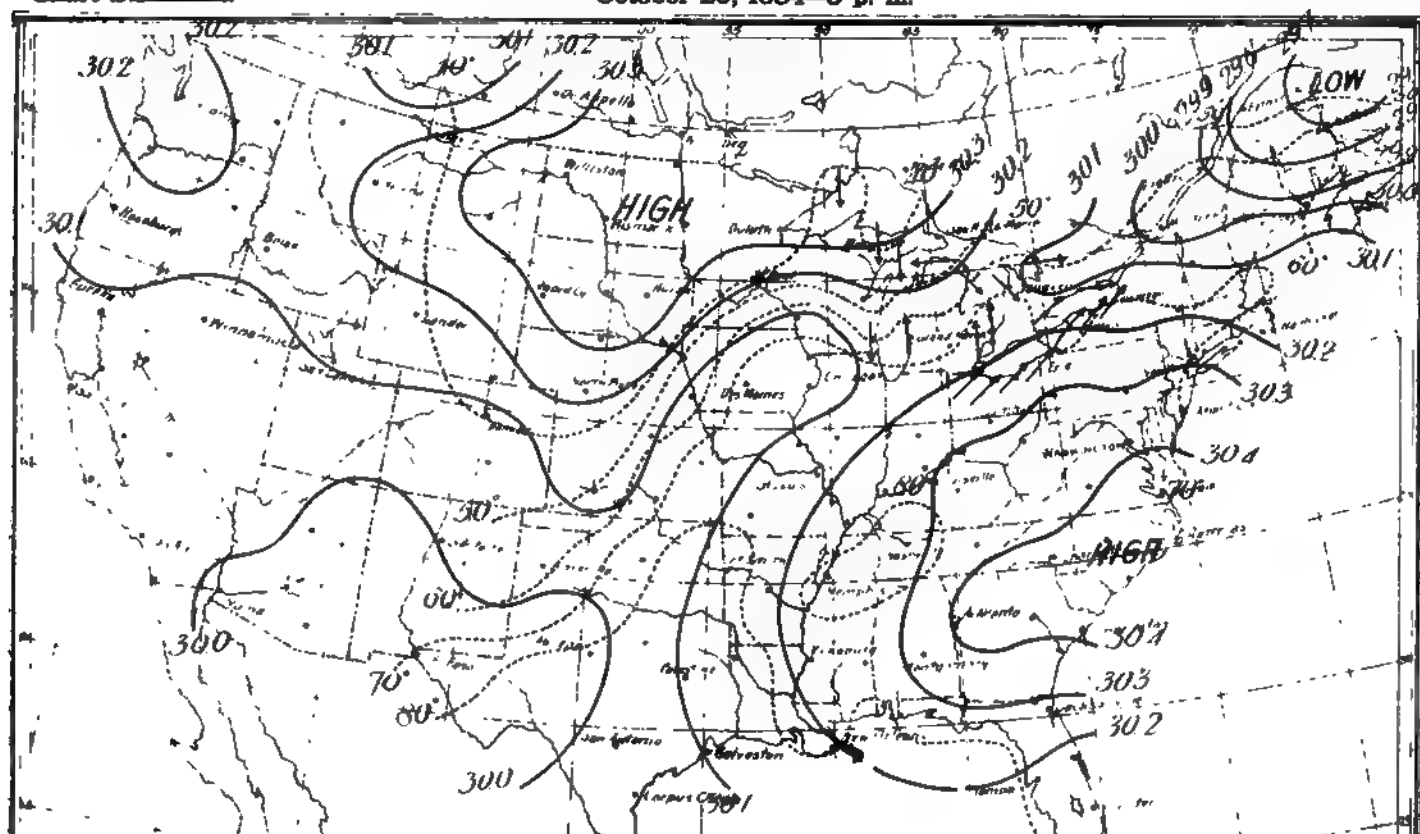


Chart DLXXXII.

October 20, 1884—3 p. m.



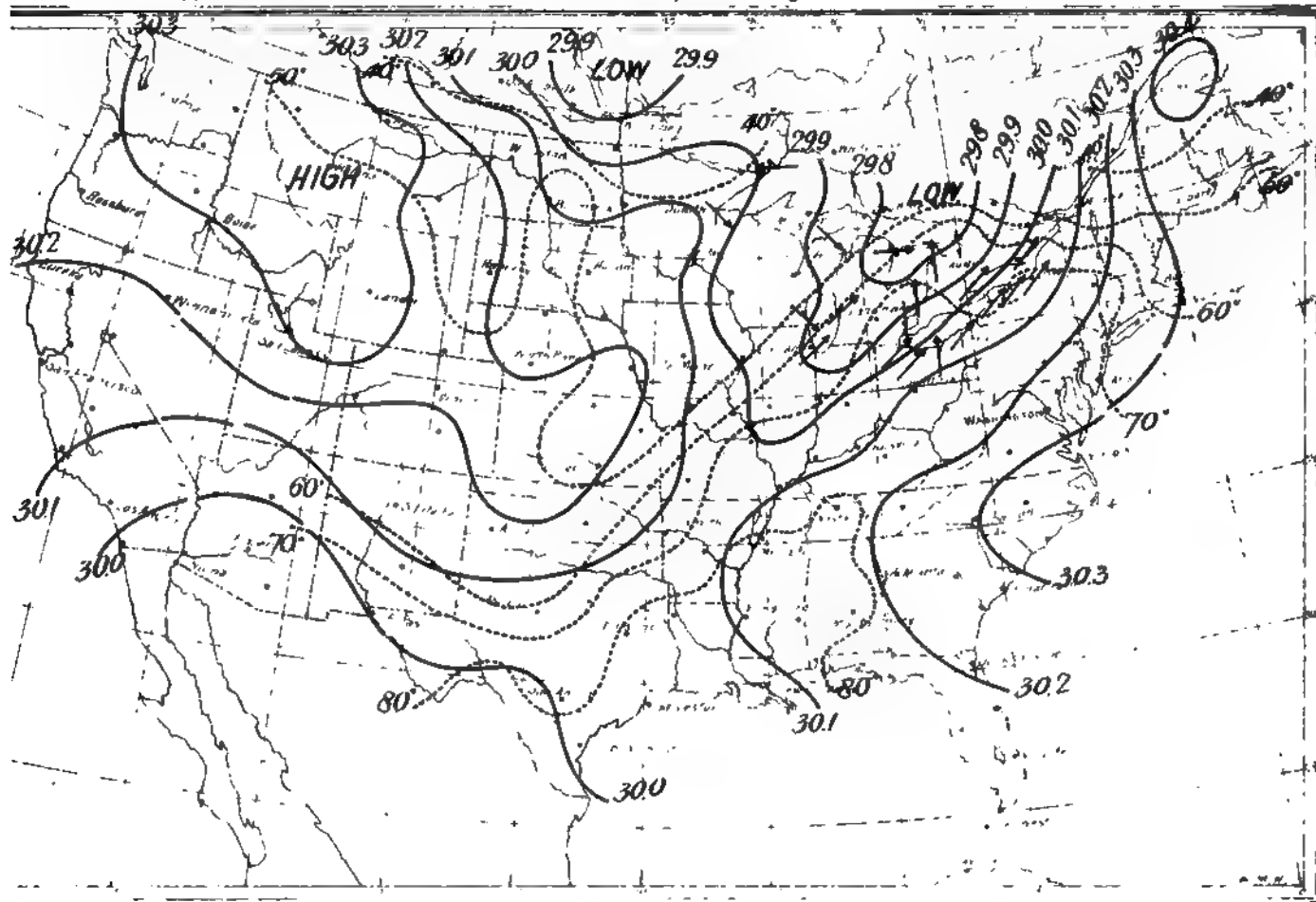
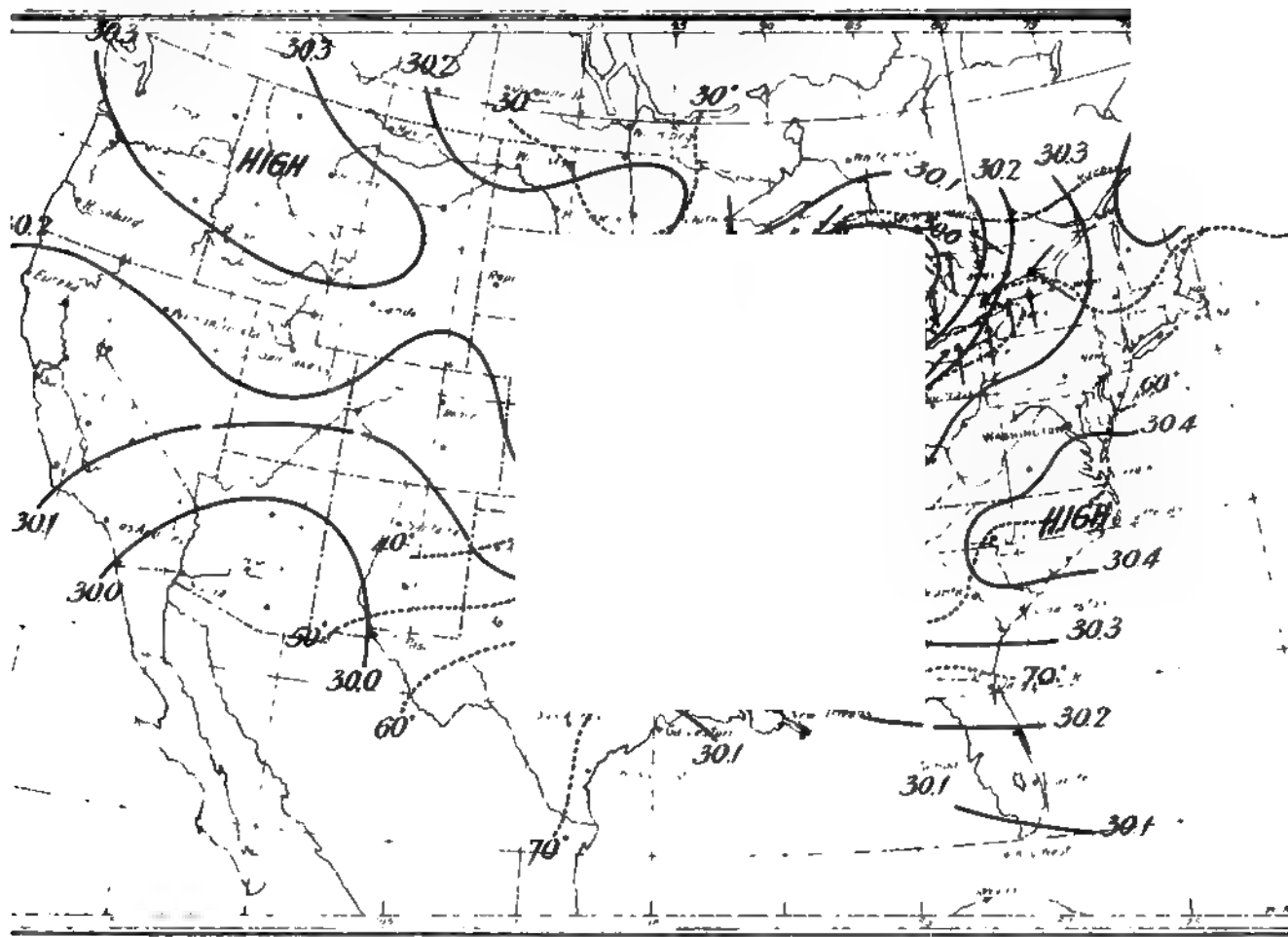


Chart DLXXXV.

October 23, 1884—8 p. m.

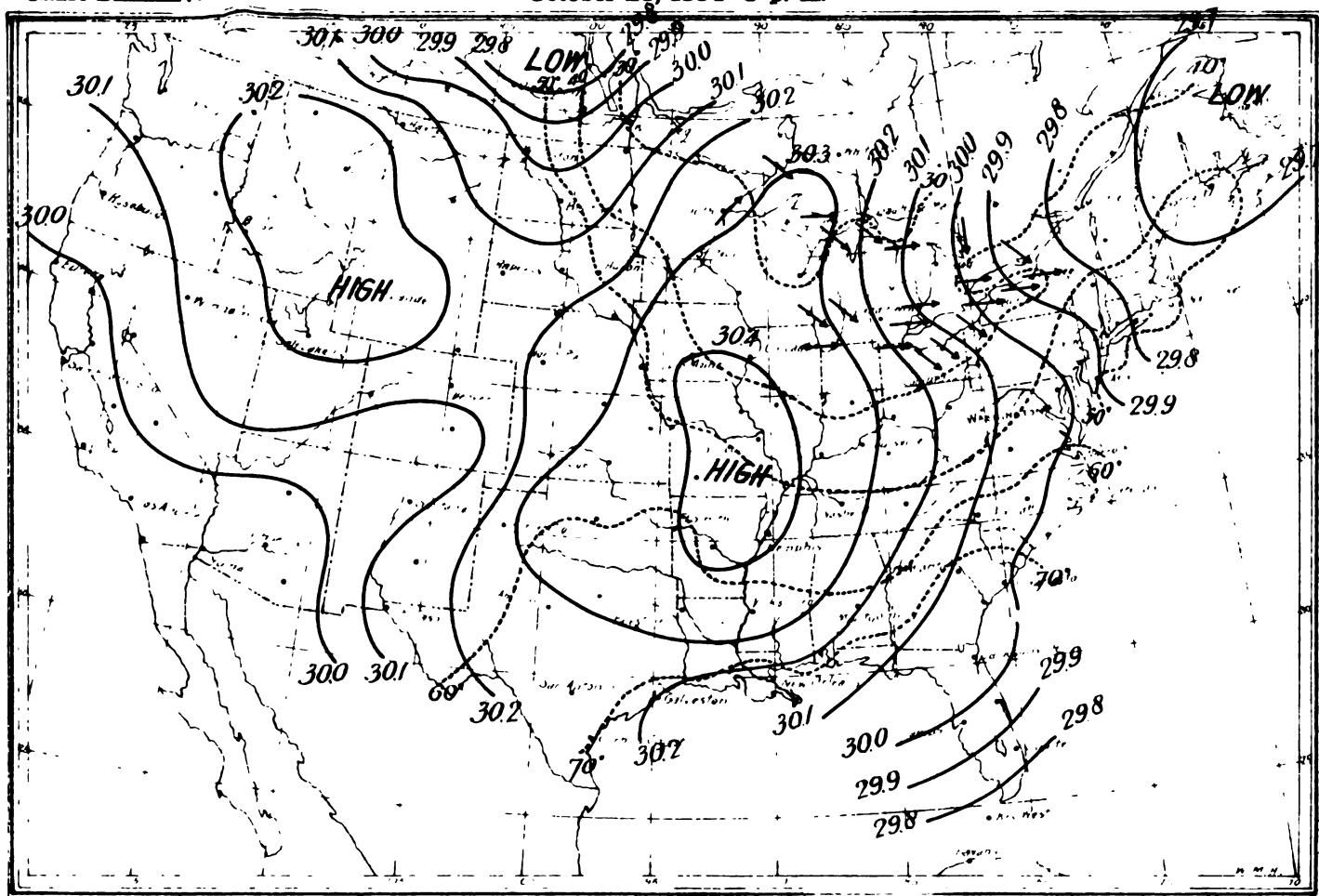
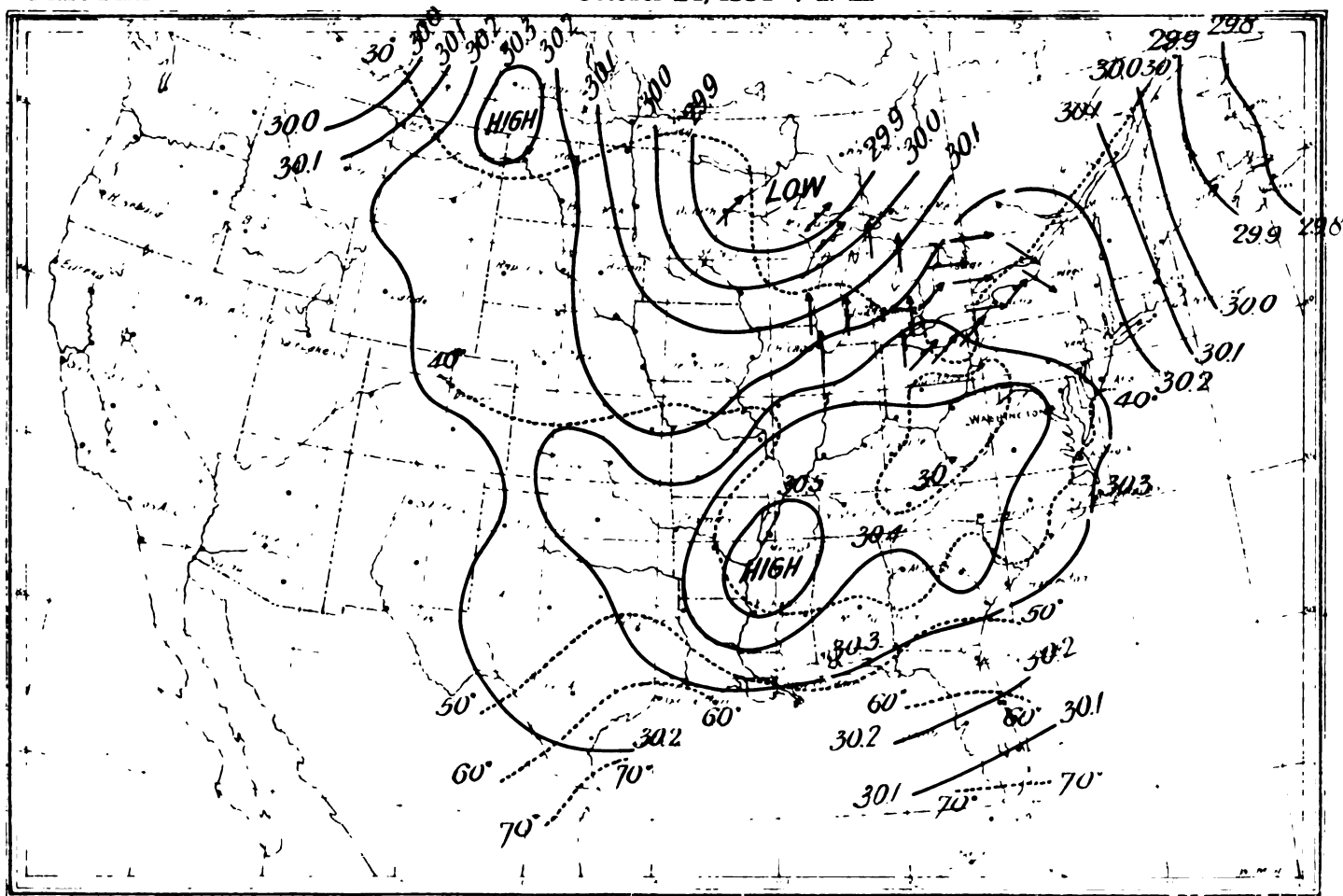


Chart DLXXXVI.

October 24, 1884—7 a. m.



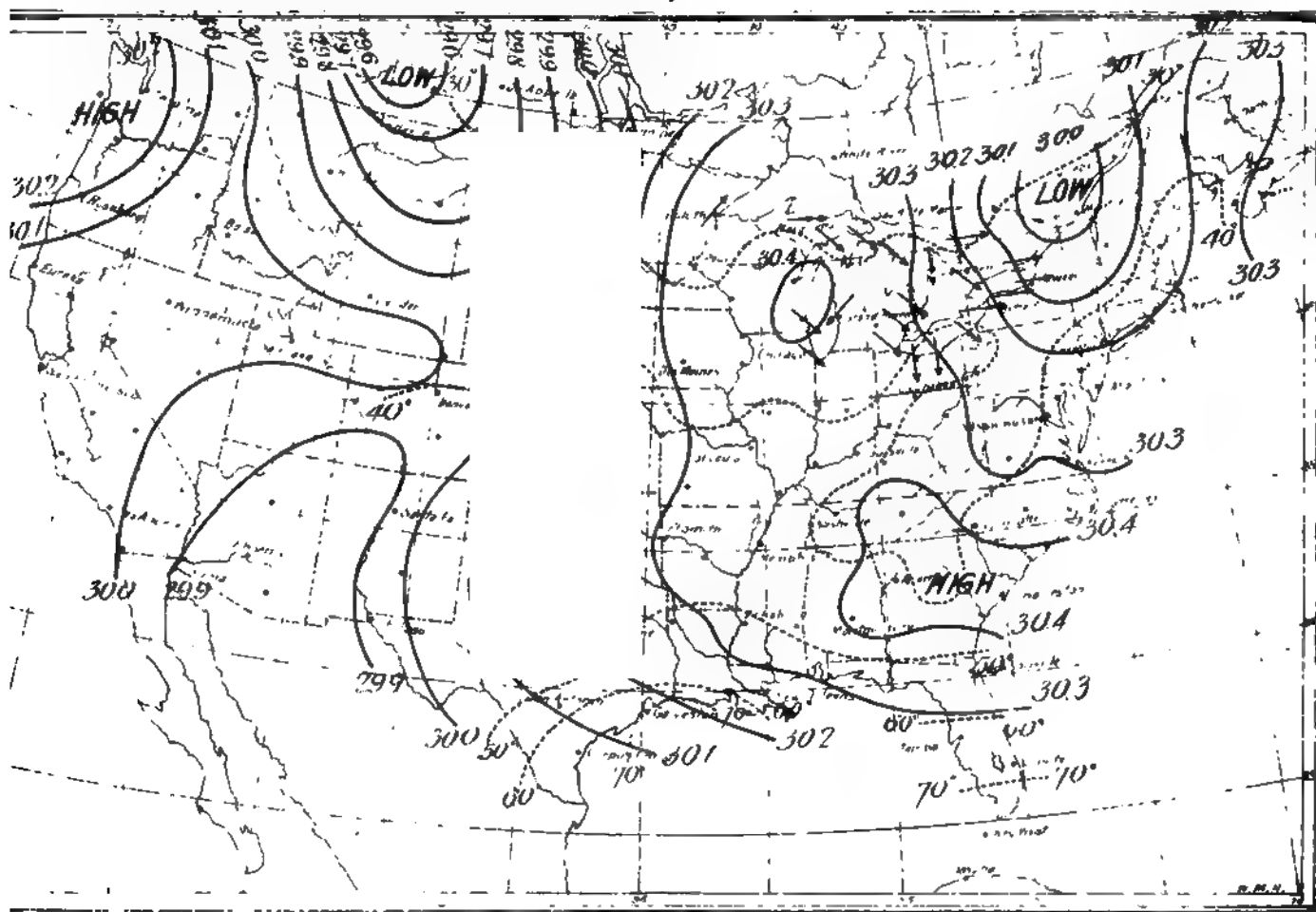


Chart DLXXXIX.

October 28, 1885—7 a. m.

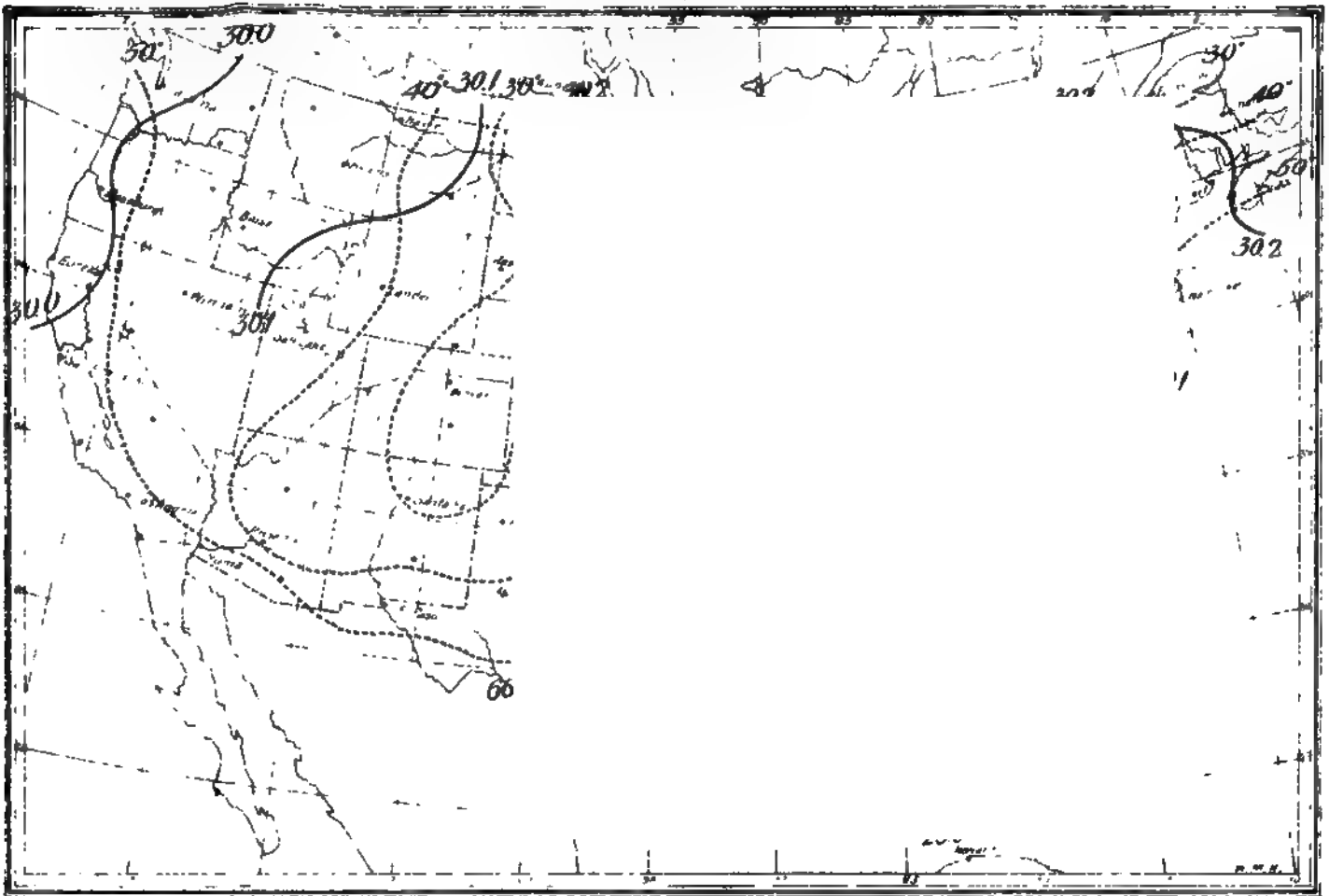


Chart DXO.

October 28, 1885—3 p. m.

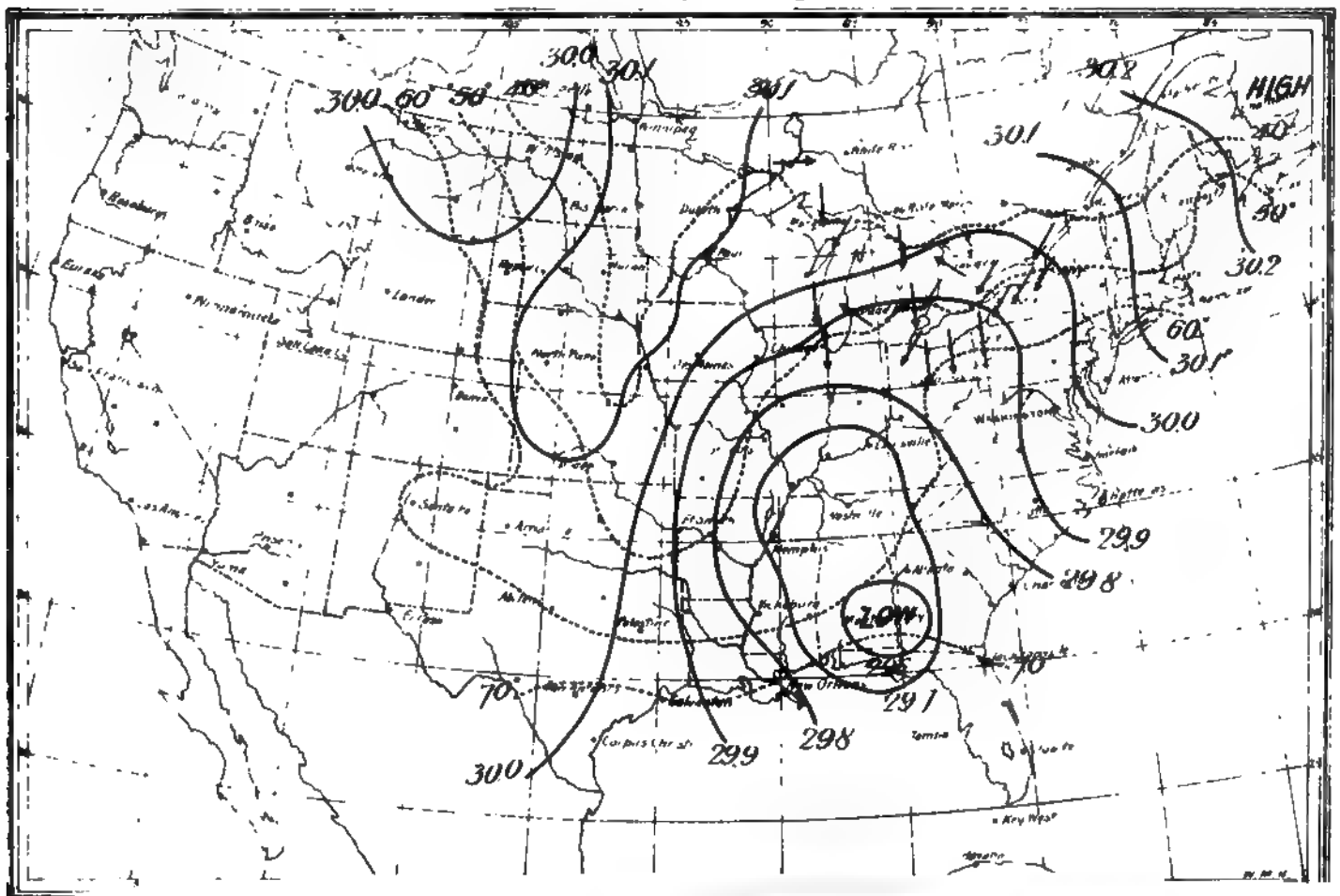


Chart DXOL

October 29, 1885—7 a. m.

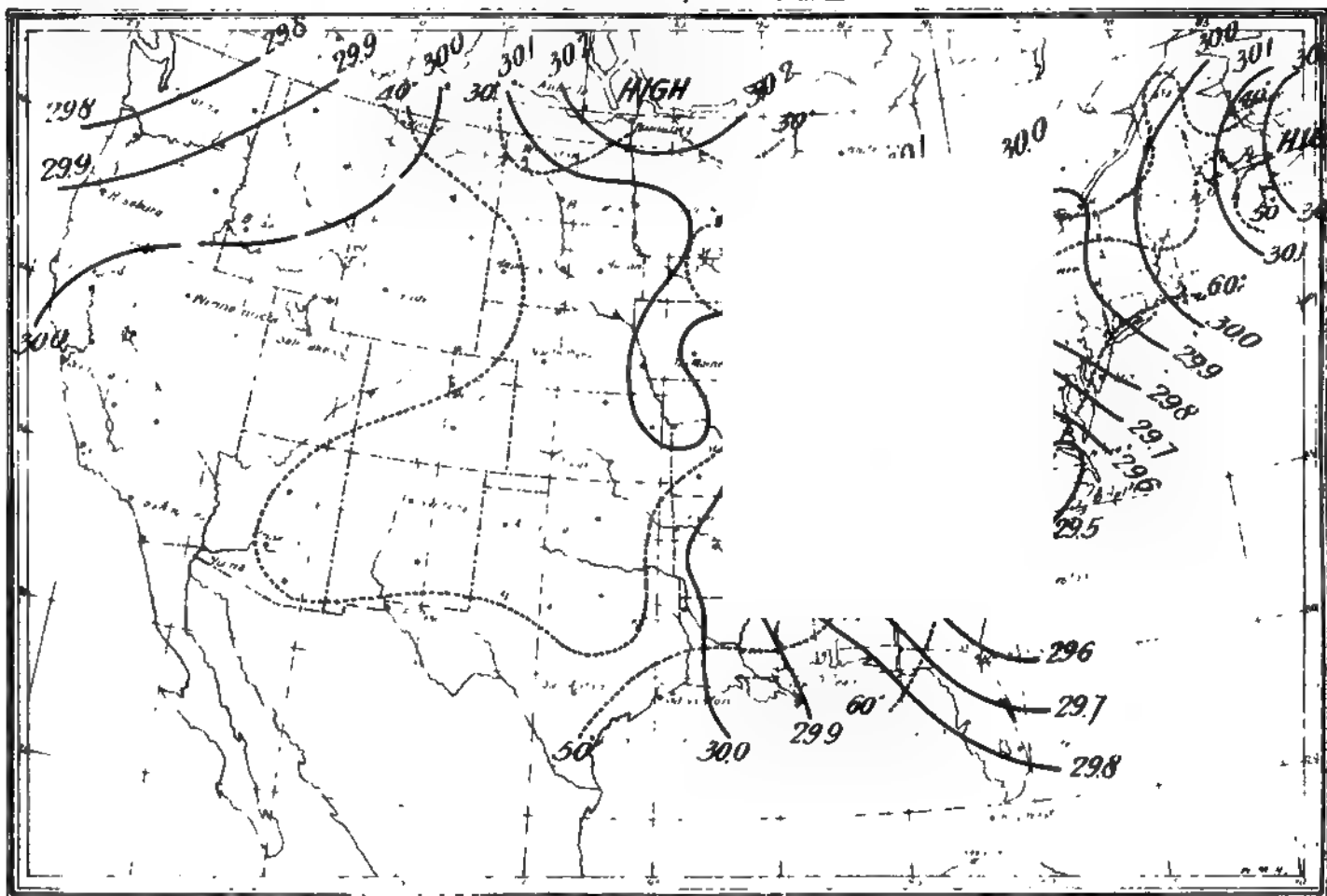


Chart DXOIL

October 29, 1885—3 p. m.

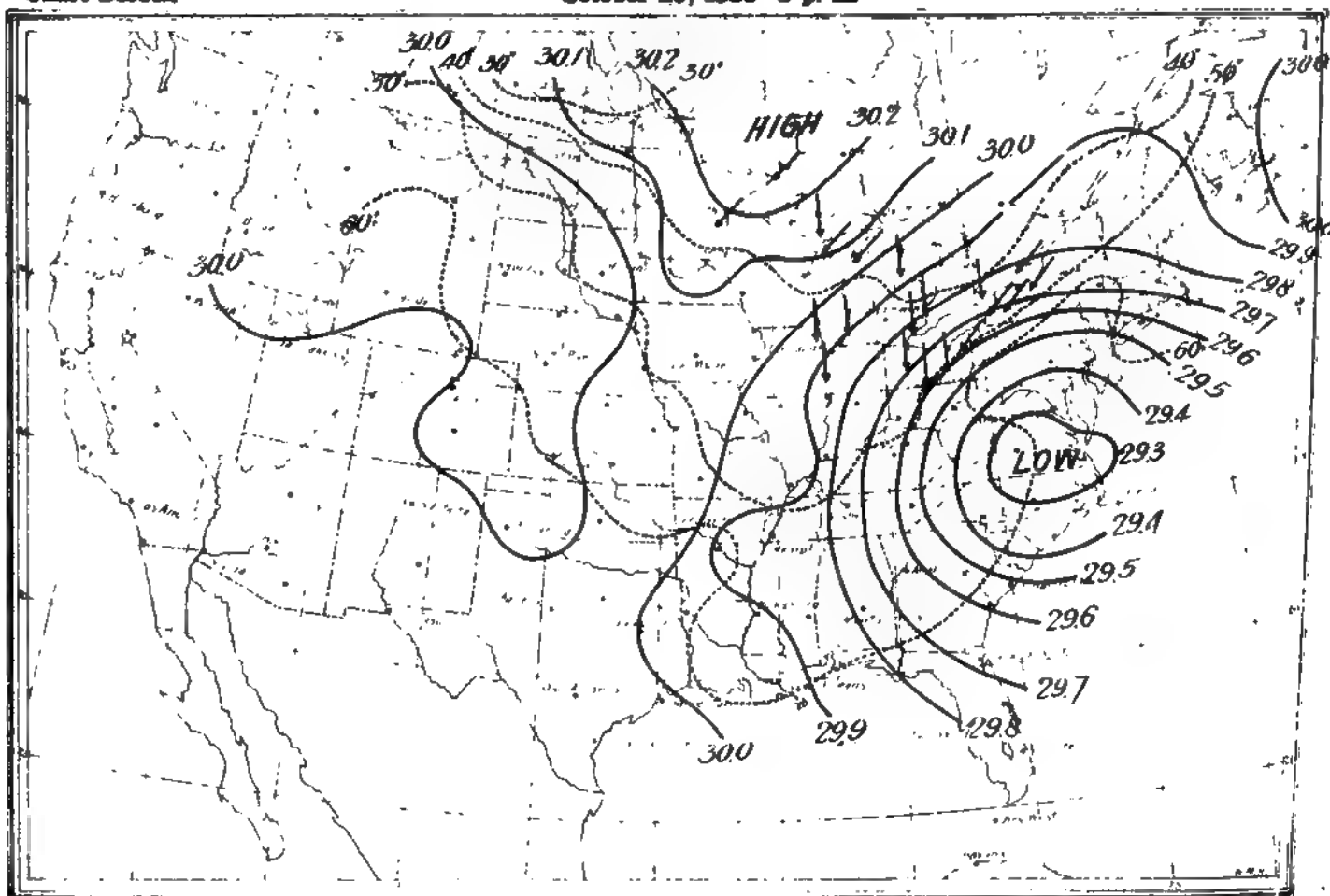


Chart DXOIII.

October 13, 1896—7 a. m.

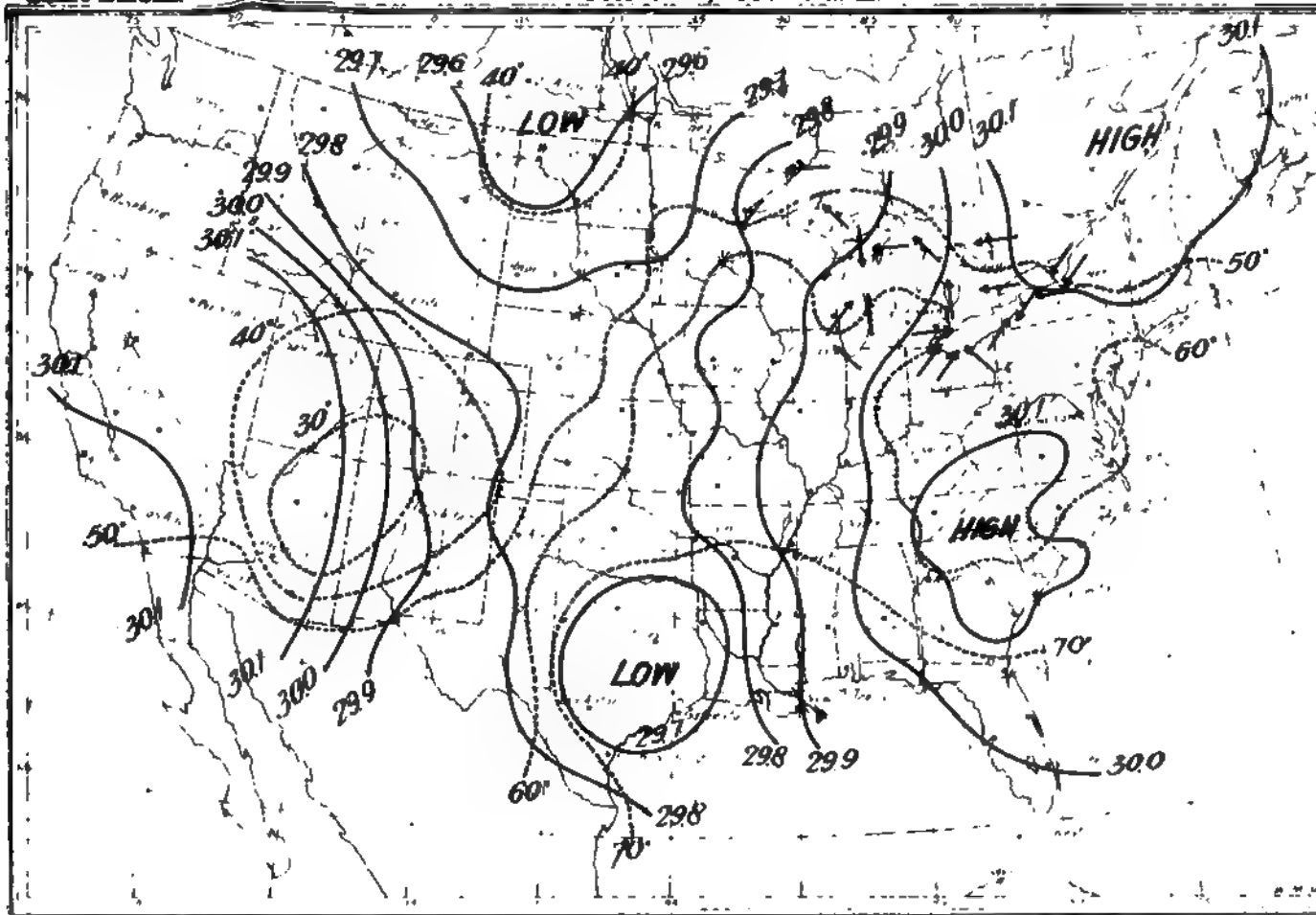


Chart DXOIV.

October 13, 1896—3 p. m.

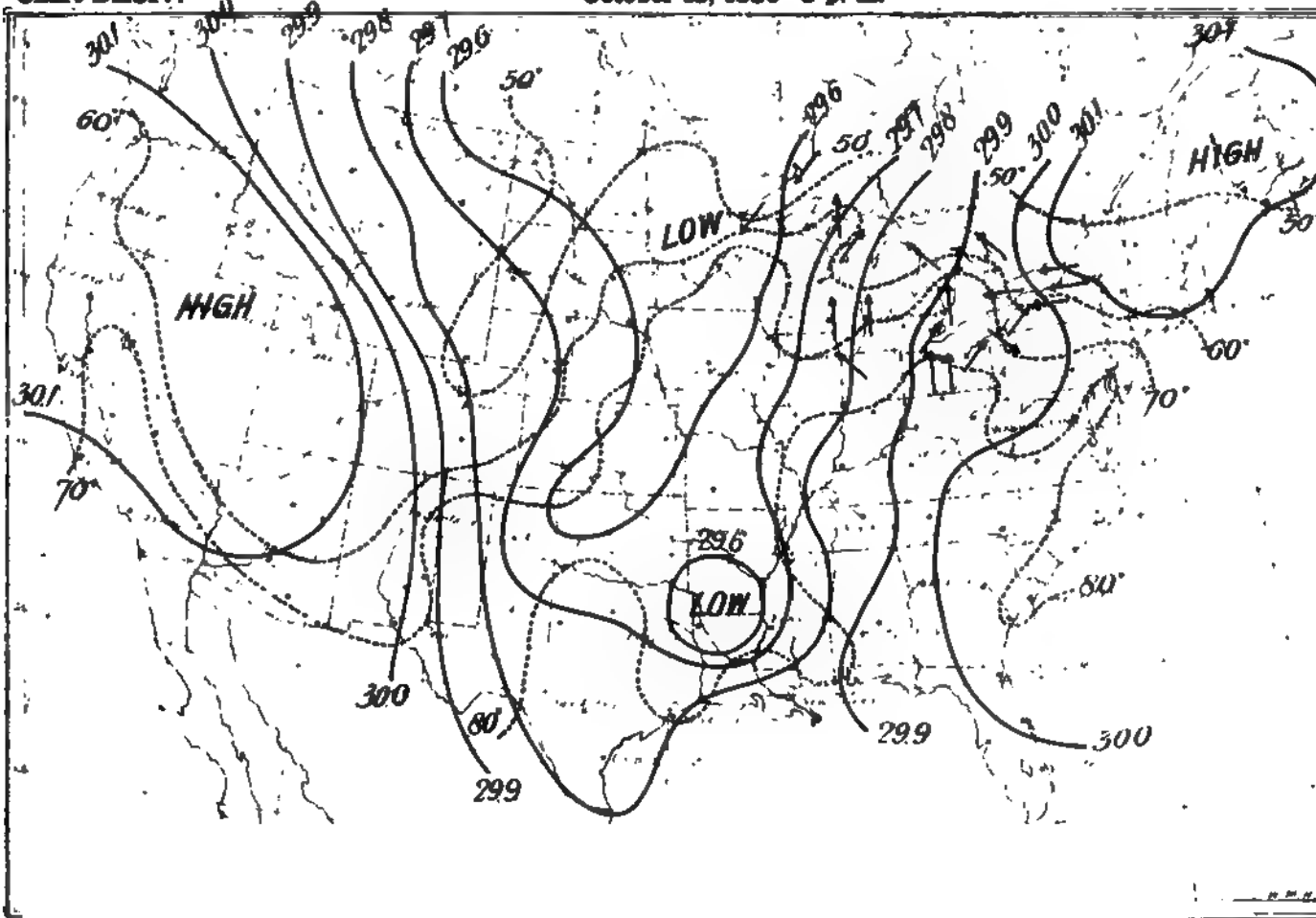


Chart DXOV.

October 14, 1886—7 a. m.

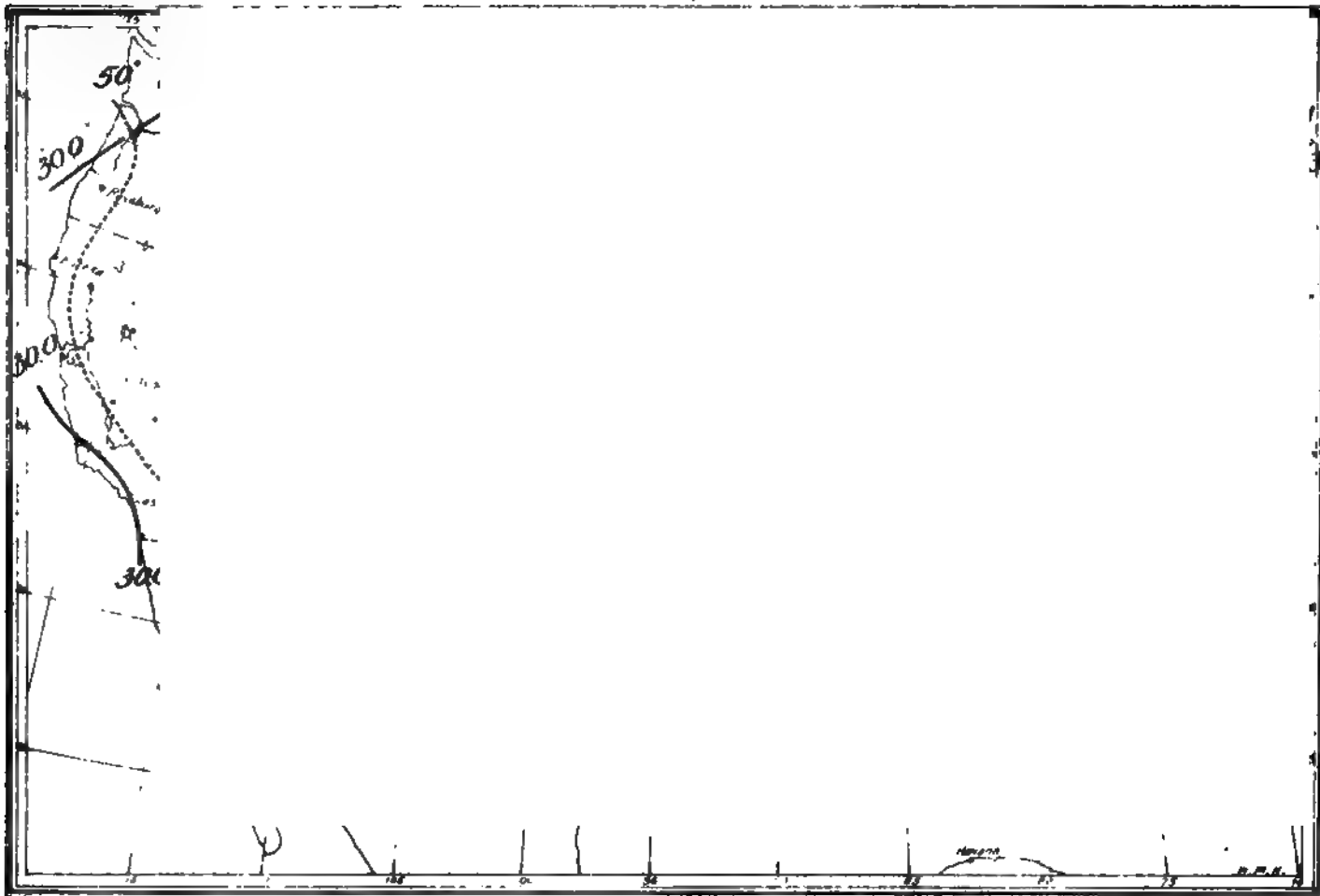


Chart DXOVI.

October 14, 1886—8 p. m.

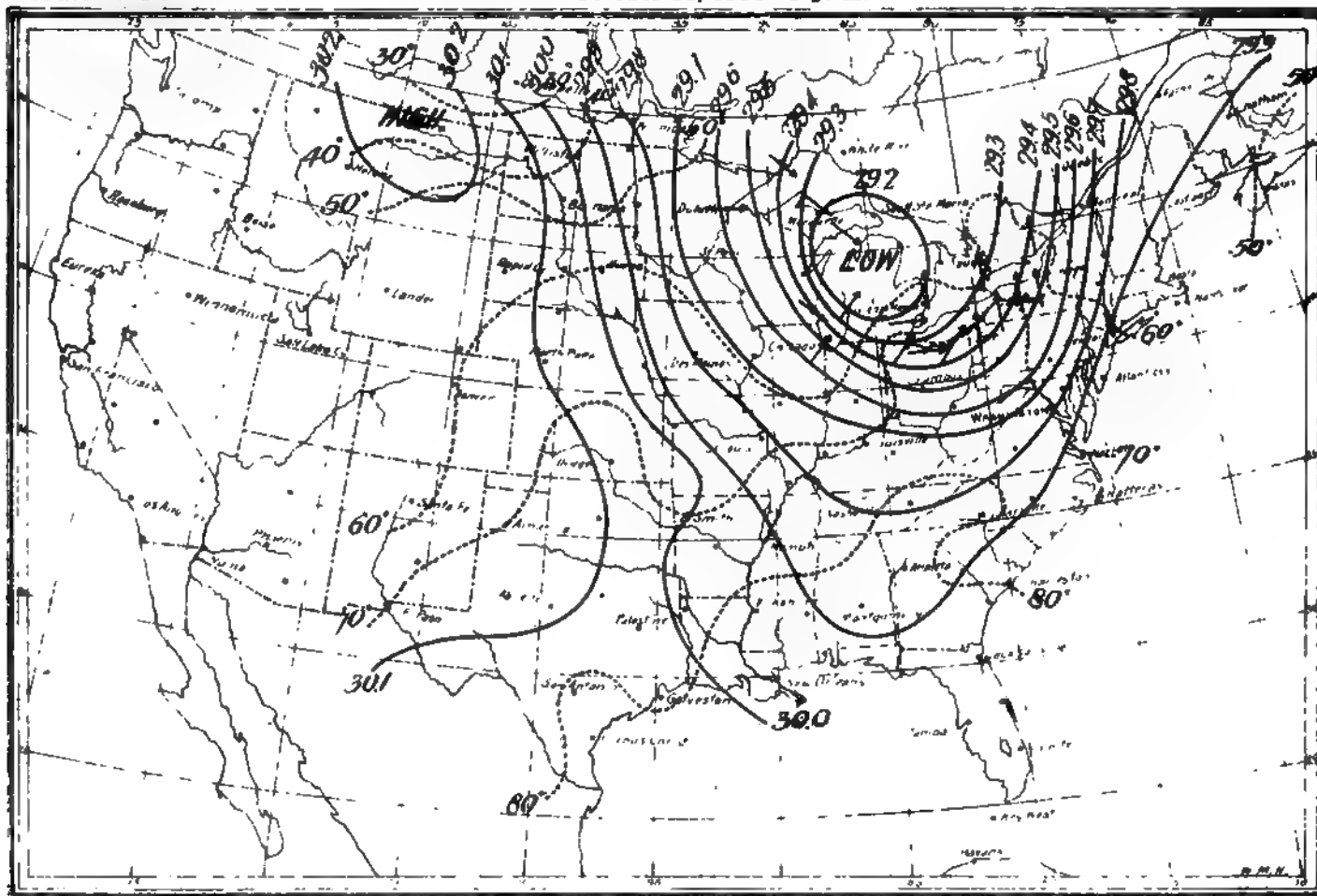


Chart DXOVII.

October 1, 1887—8 p. m.

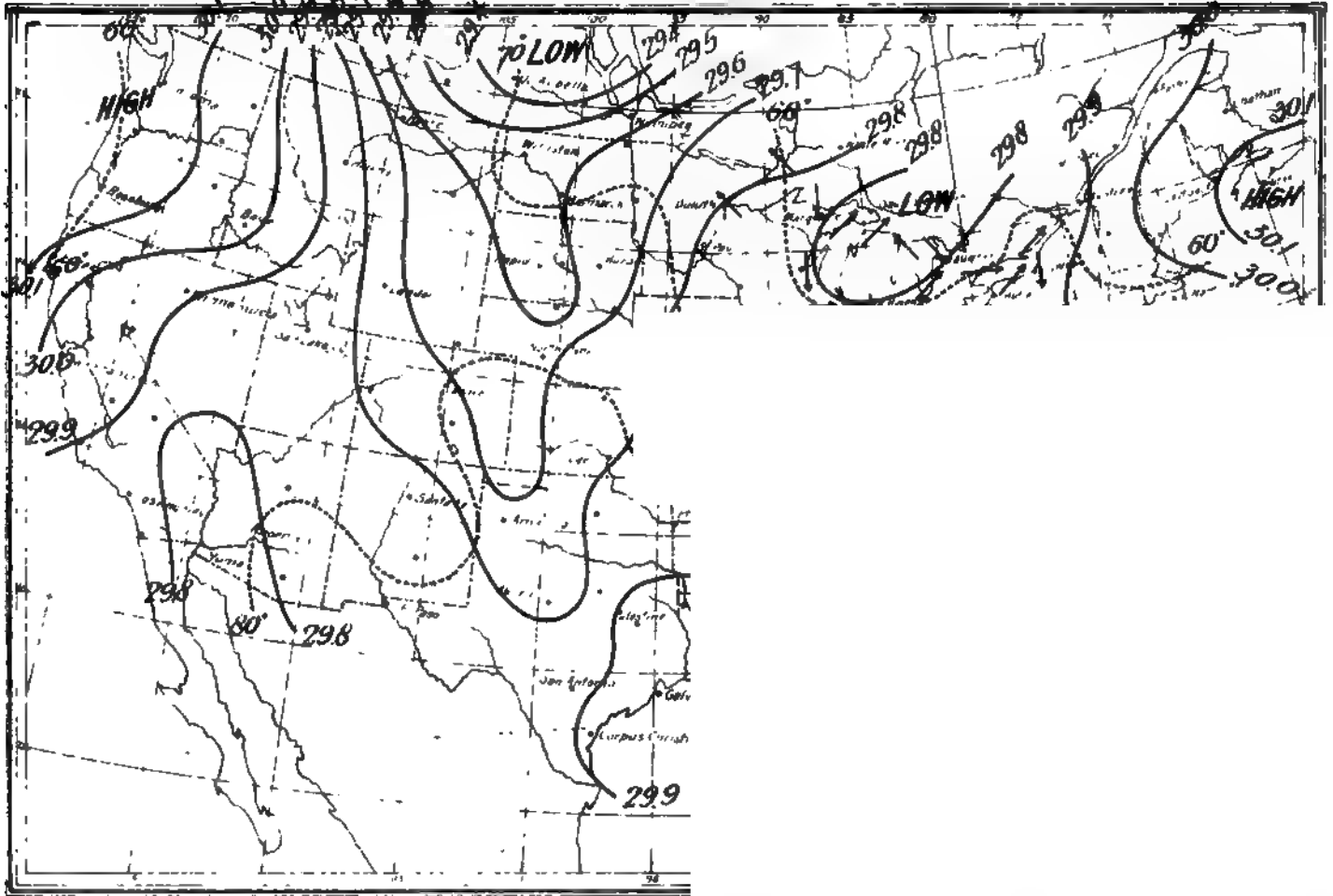
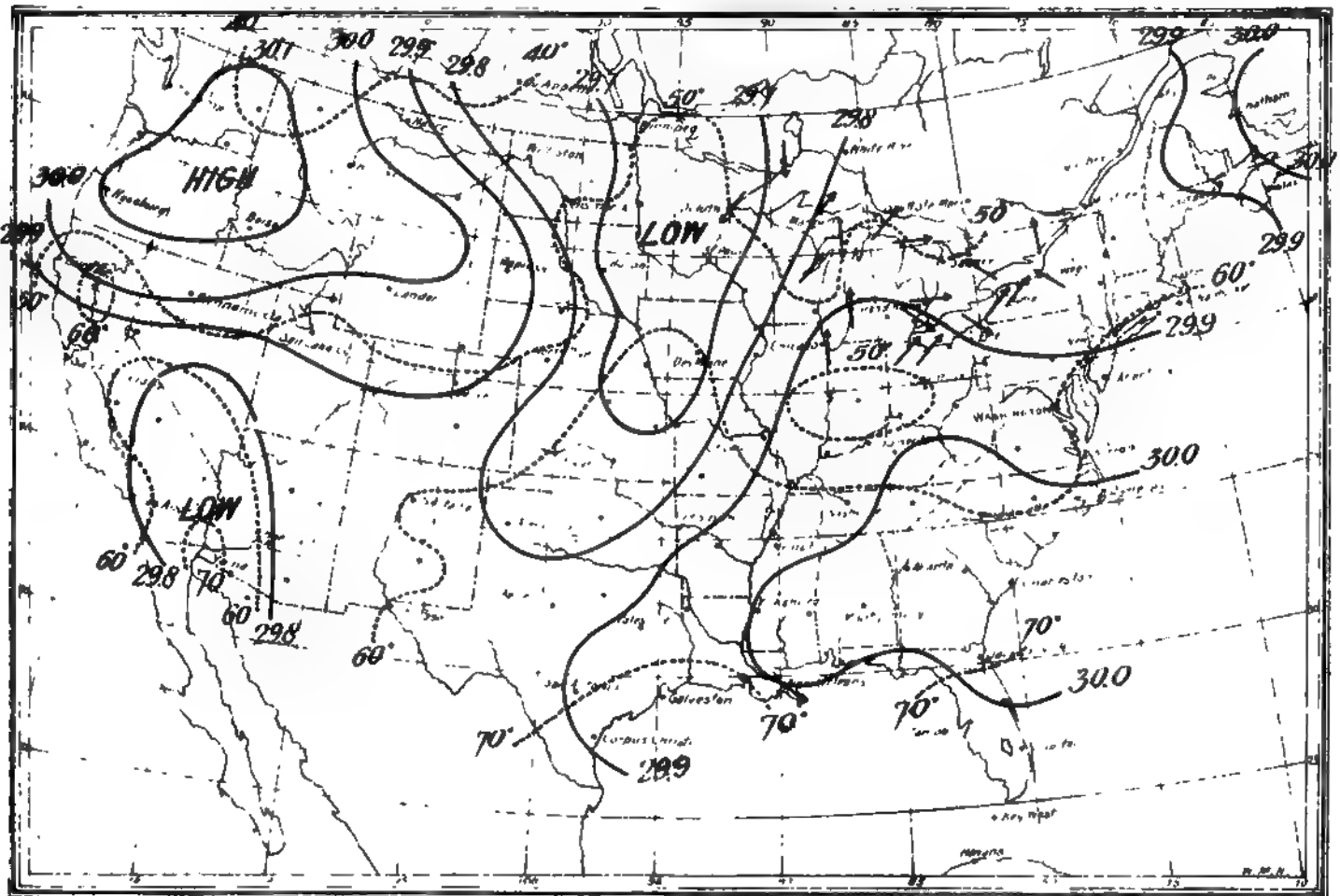
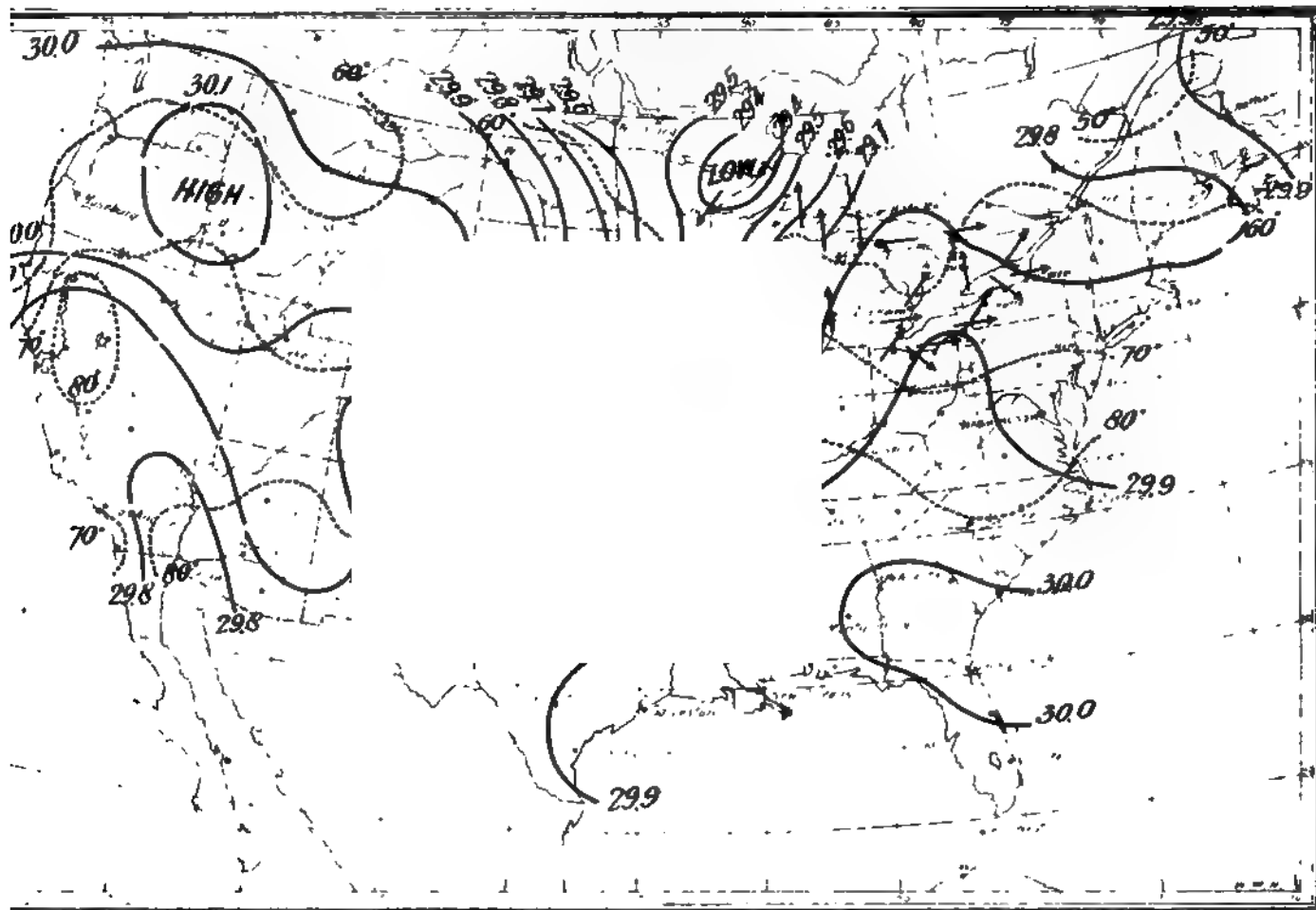


Chart DXOVIII.

October 2, 1887—7 a. m.



October 2, 1887—3 p. m.



October 3, 1887—7 a. m.

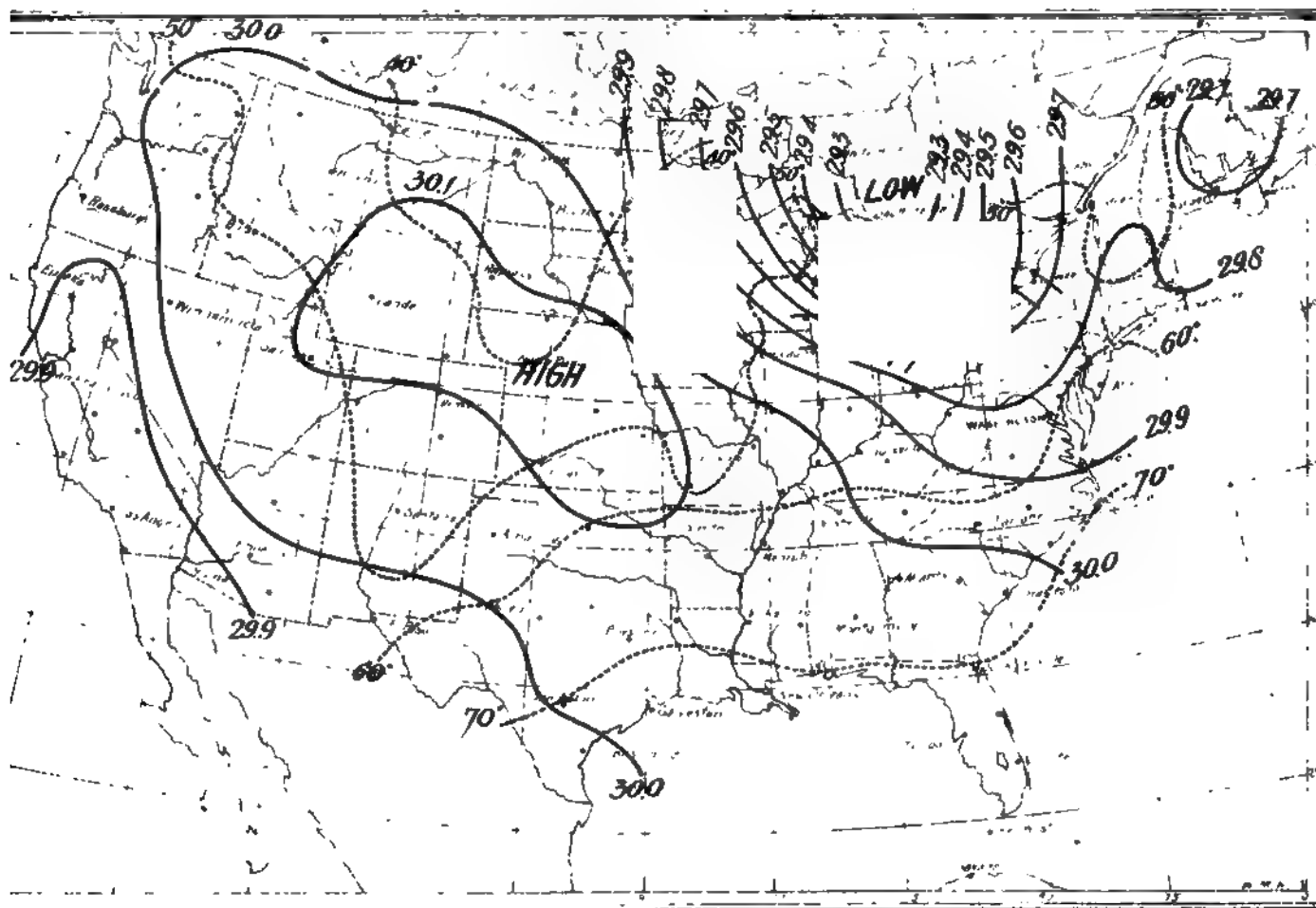


Chart DCL

October 22, 1887—8 p. m.

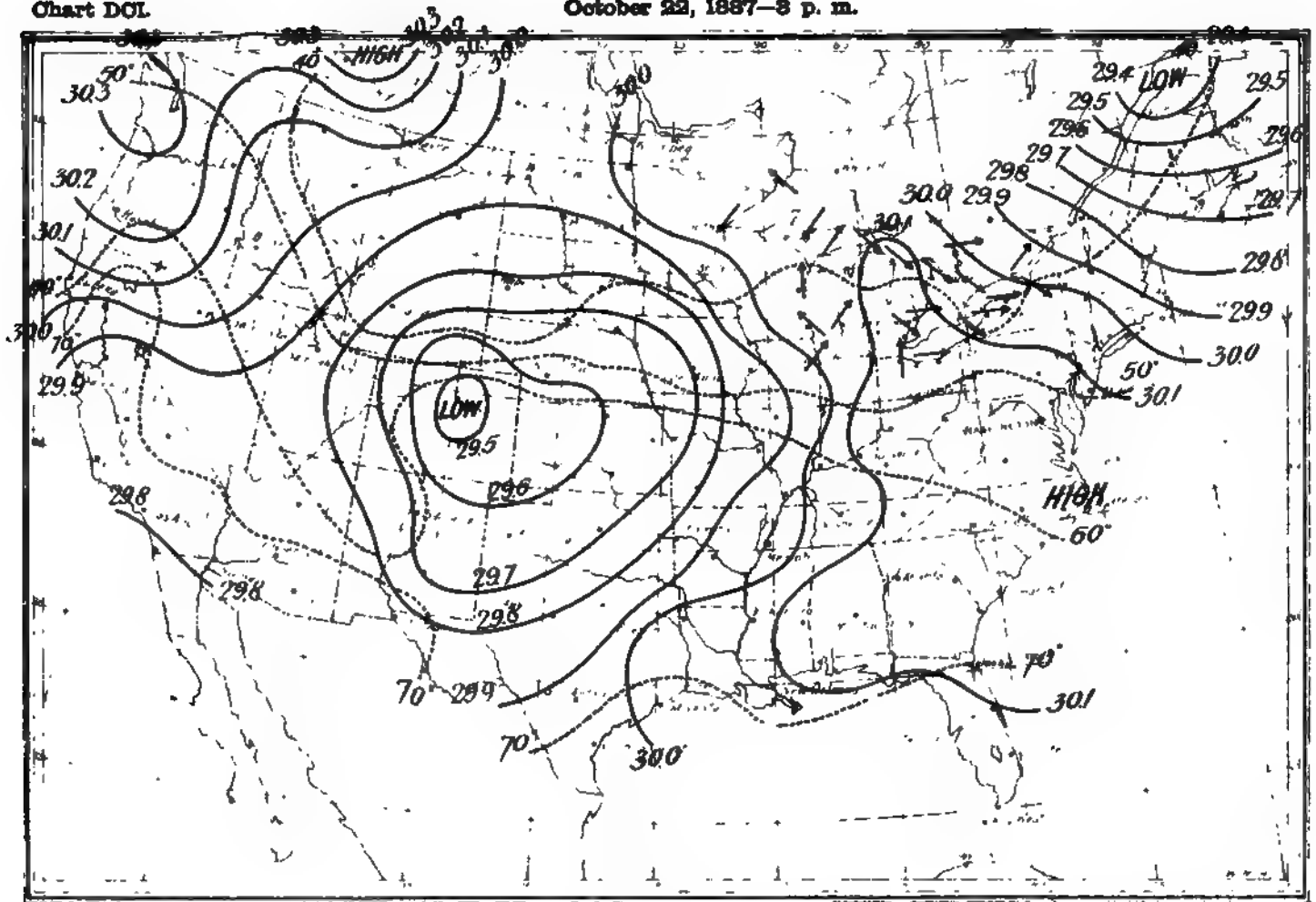


Chart DCL

October 23, 1887—7 a. m.

Chart DCM.

October 28, 1887—3 p. m.

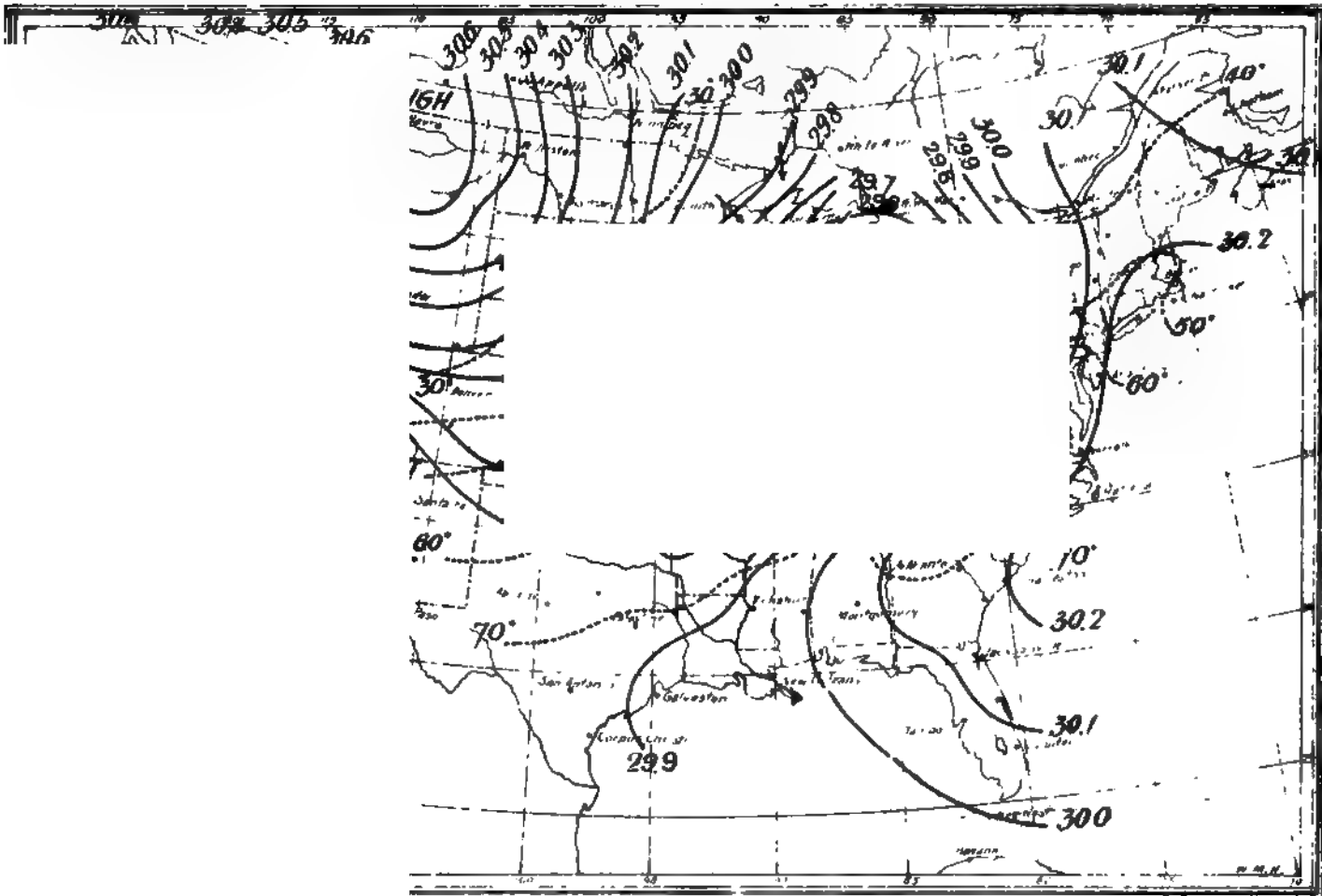


Chart DOTV.

October 24, 1887—7 a. m.

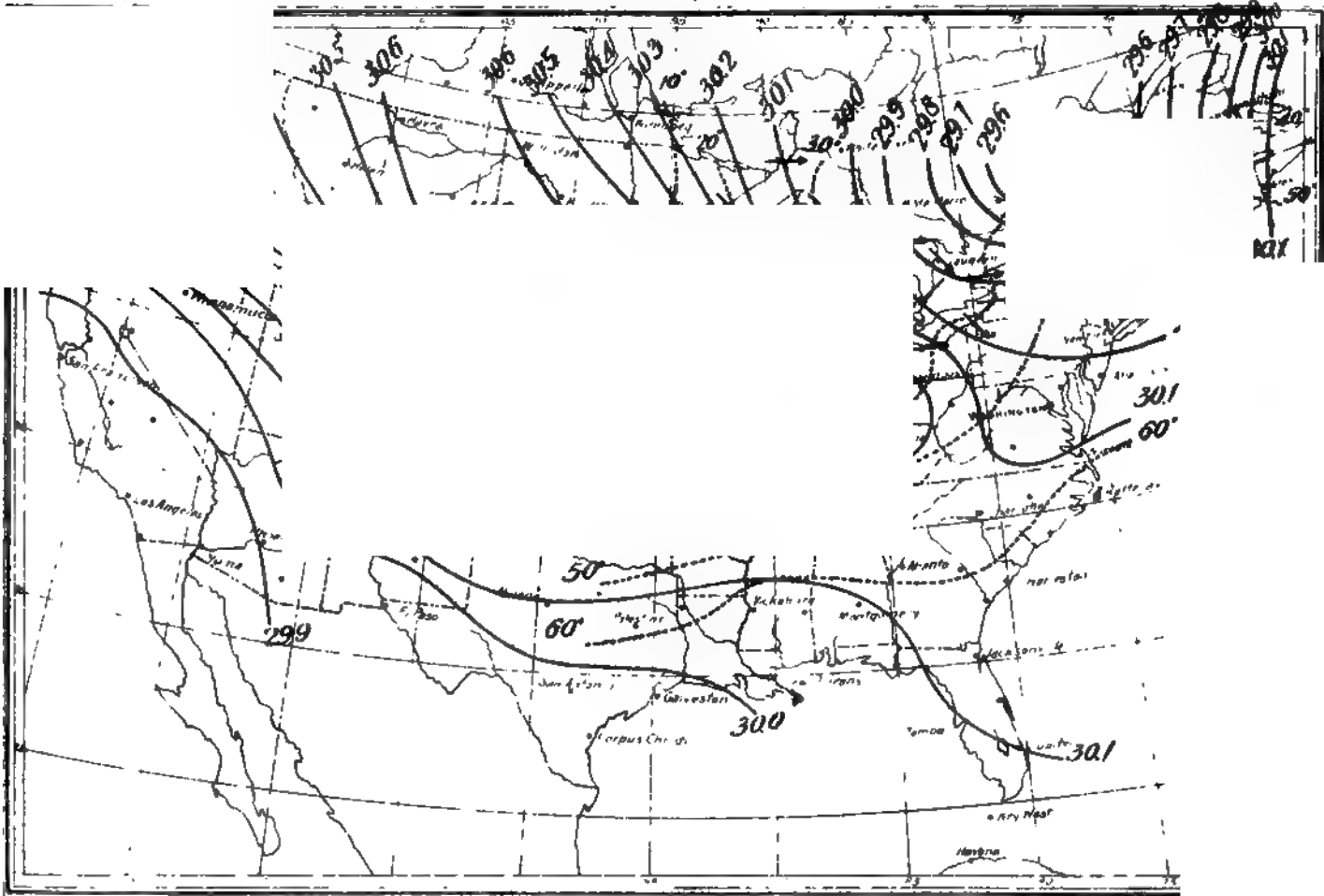


Chart DOV.

October 4, 1889—8 a. m.

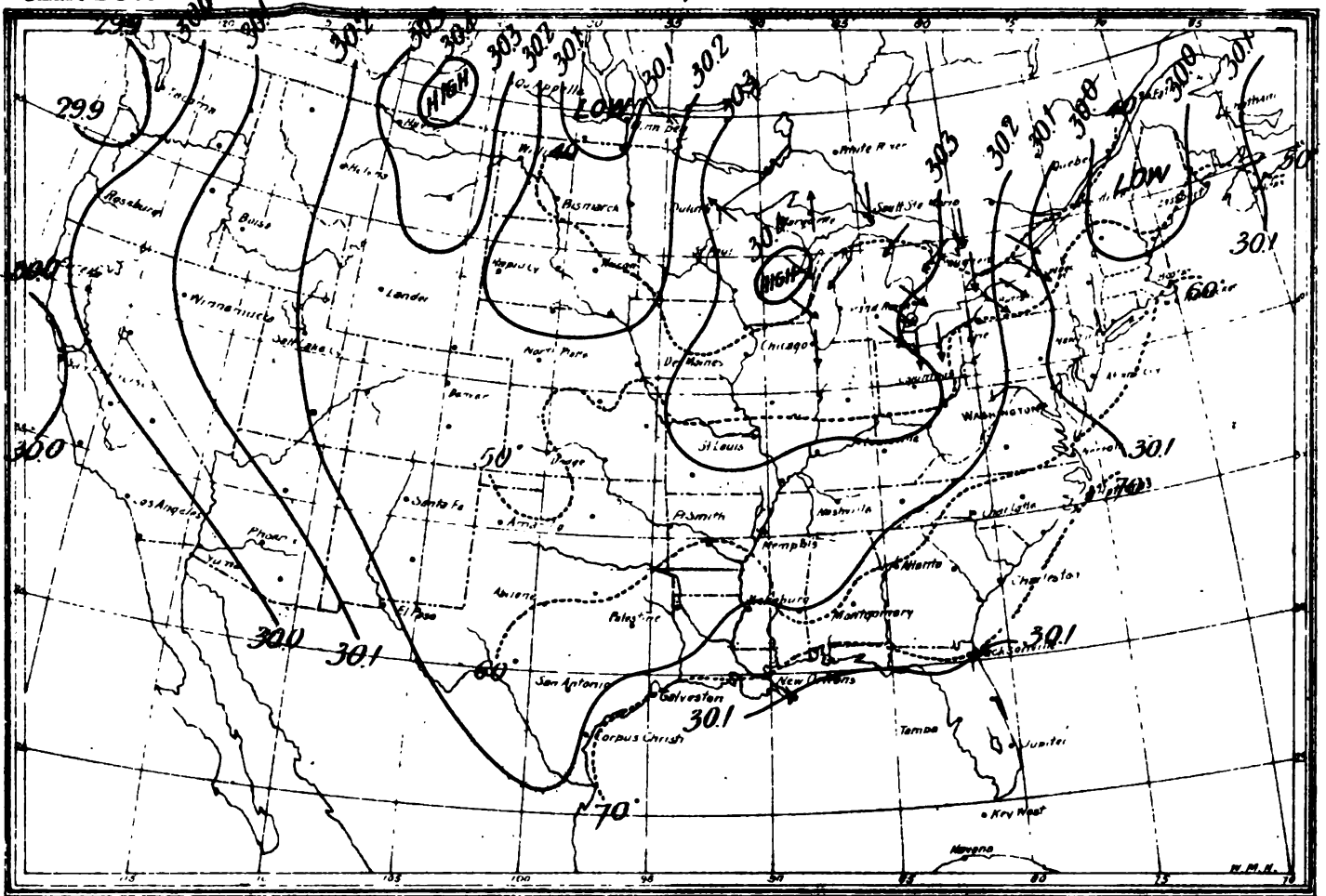


Chart DOV I.

October 4, 1889—8 p. m.

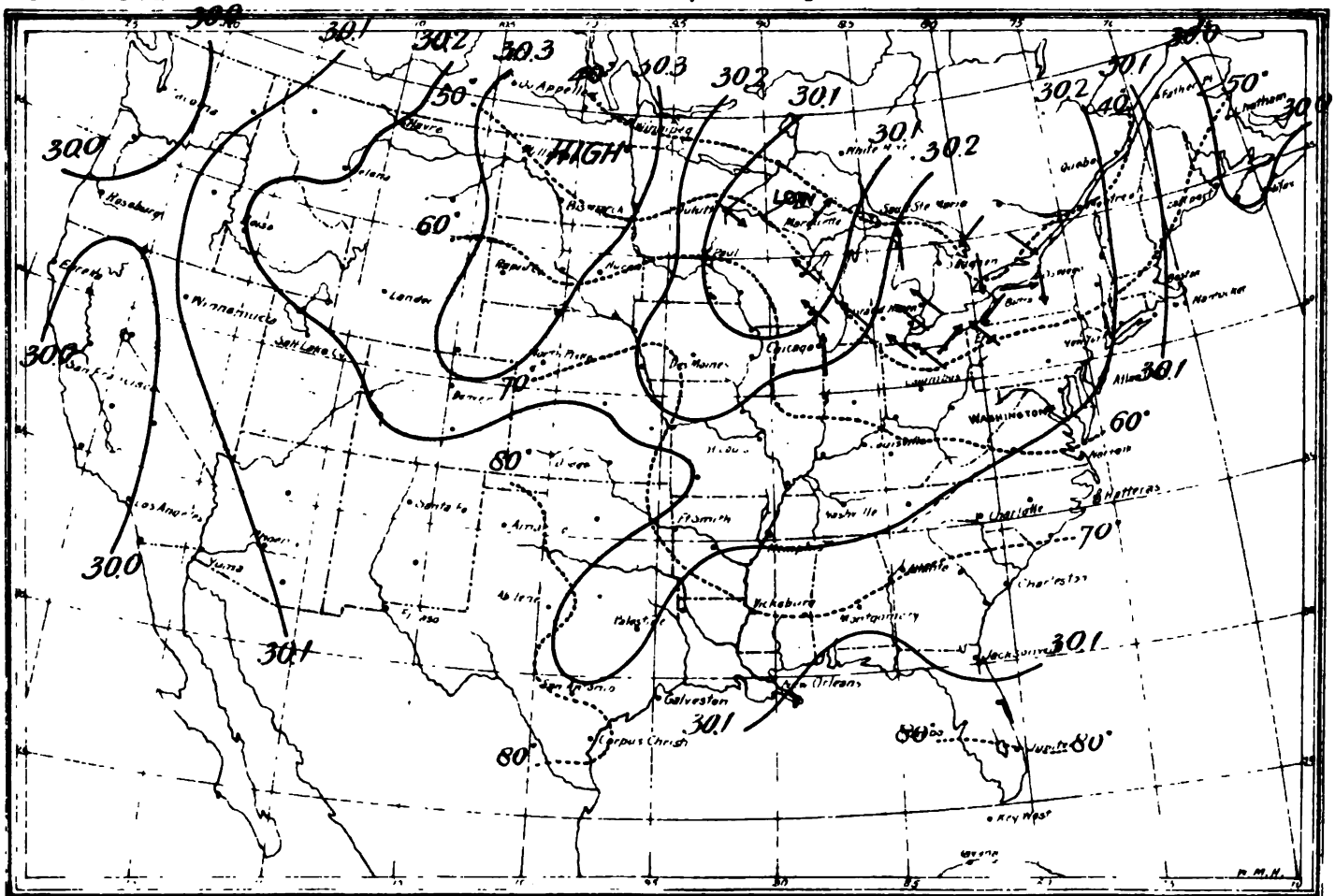


Chart DXOI.

October 29, 1885—7 a. m.

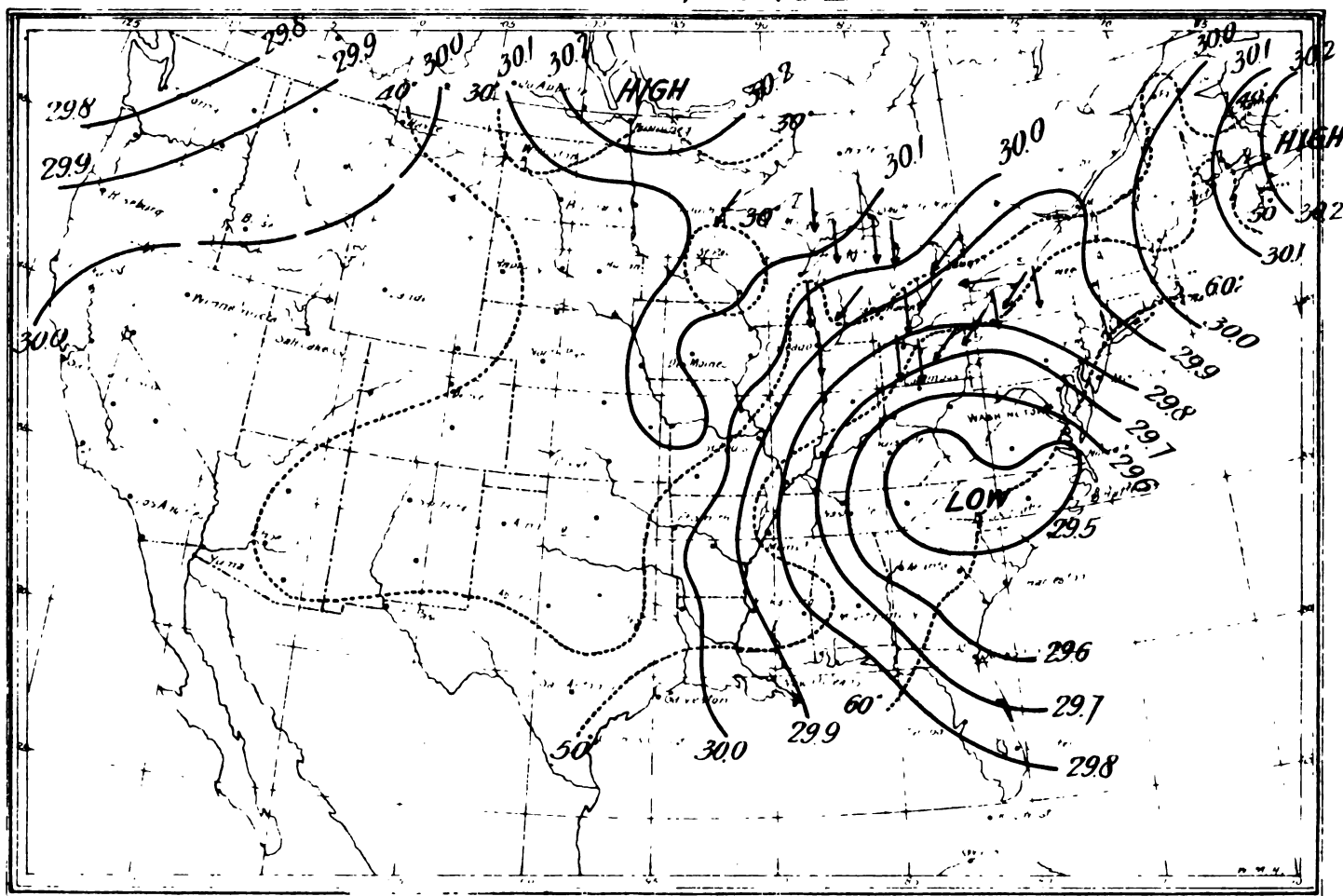


Chart DXOII.

October 29, 1885—3 p. m.

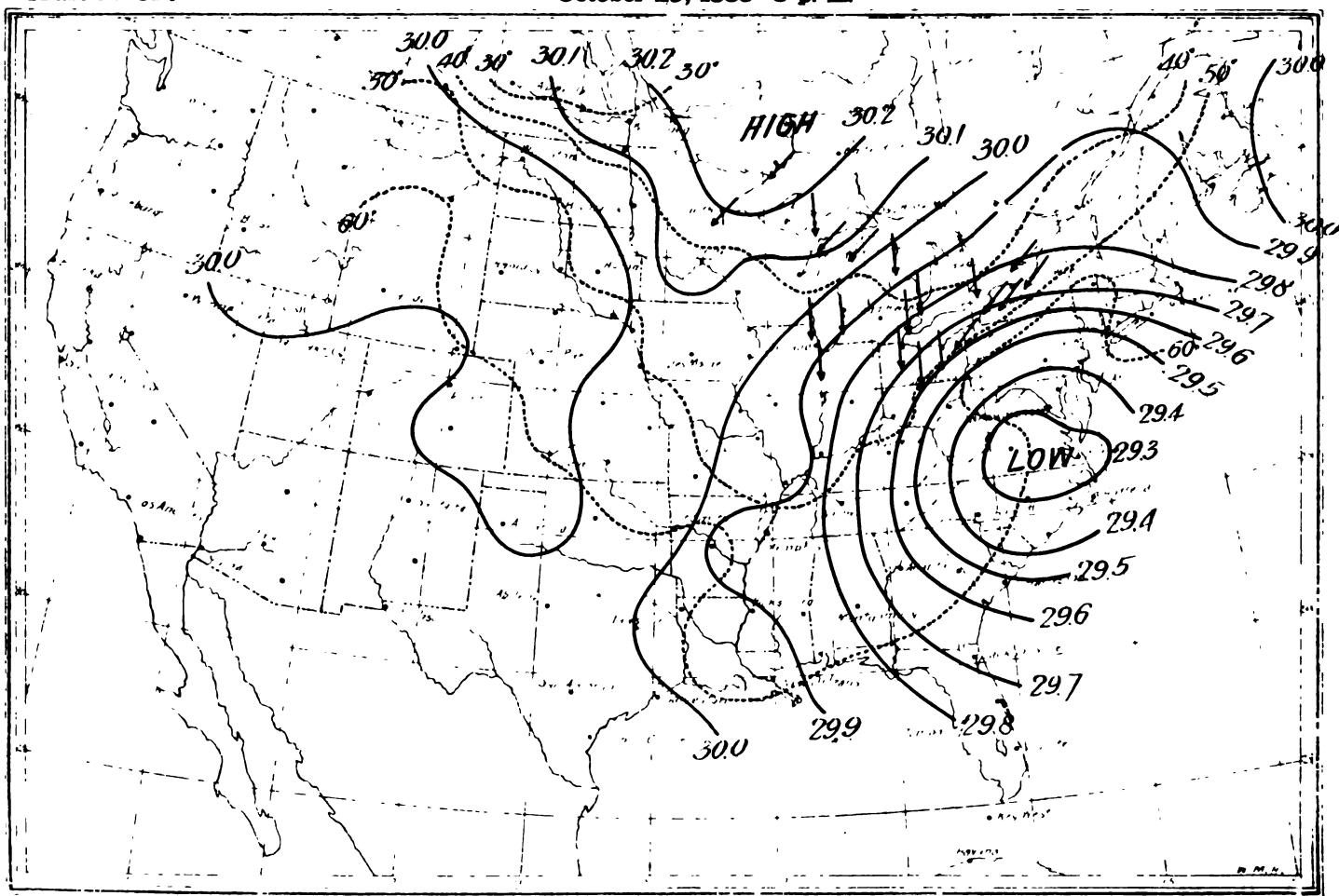


Chart DXCIII.

October 13, 1896—7 a. m.

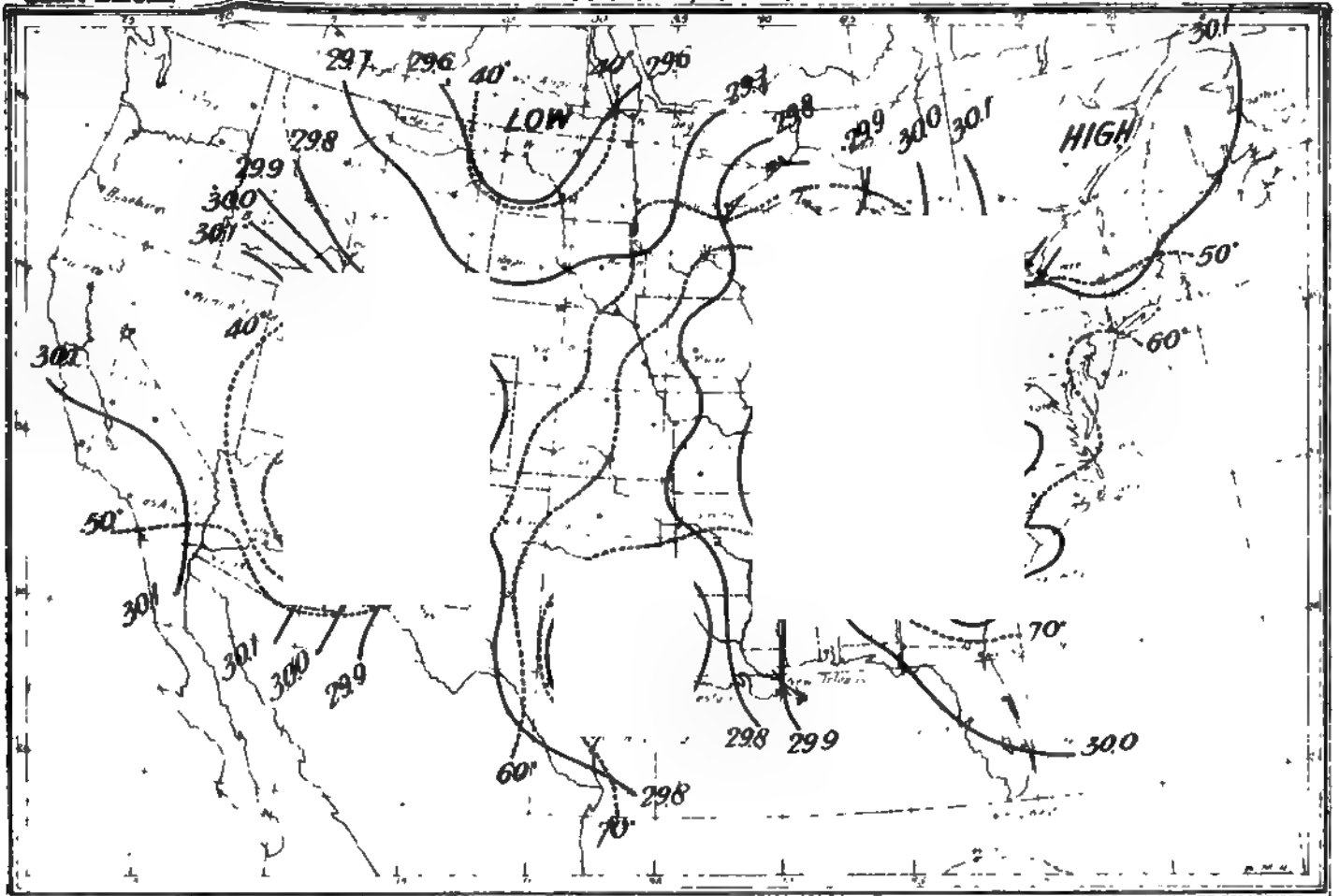


Chart DXCIII.

October 13, 1896—7 a. m.

Chart DXCI.

October 29, 1885—7 a. m.

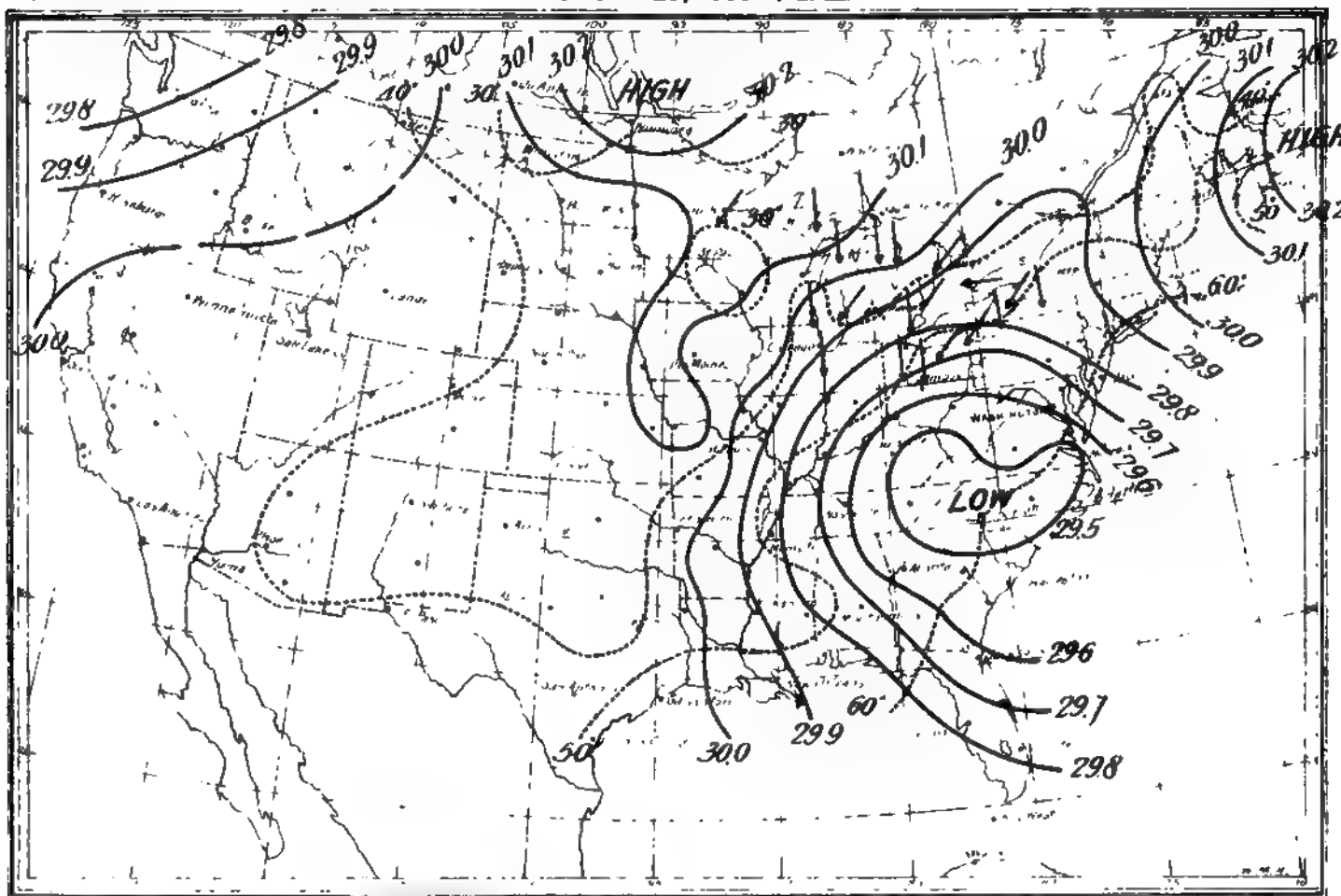
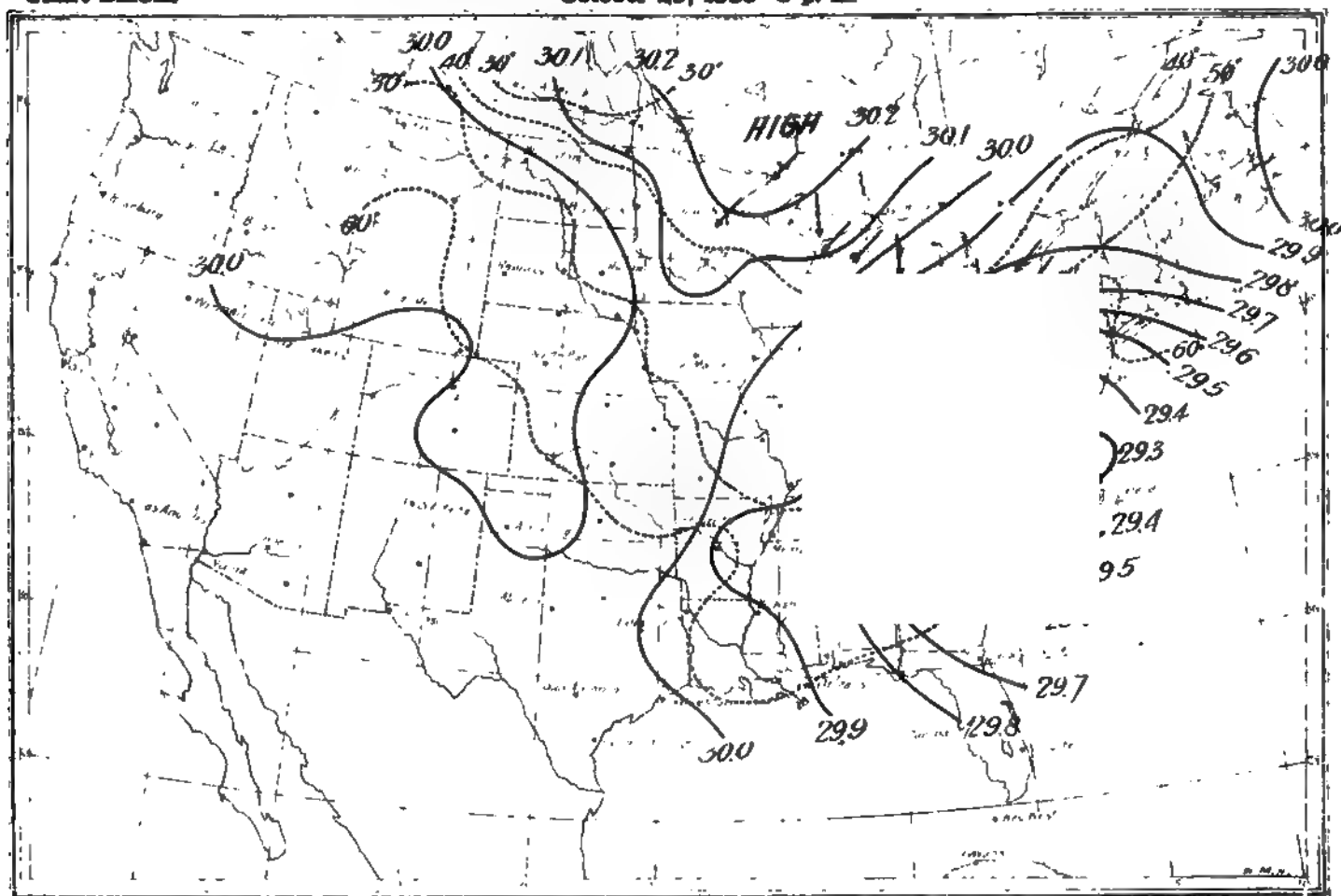
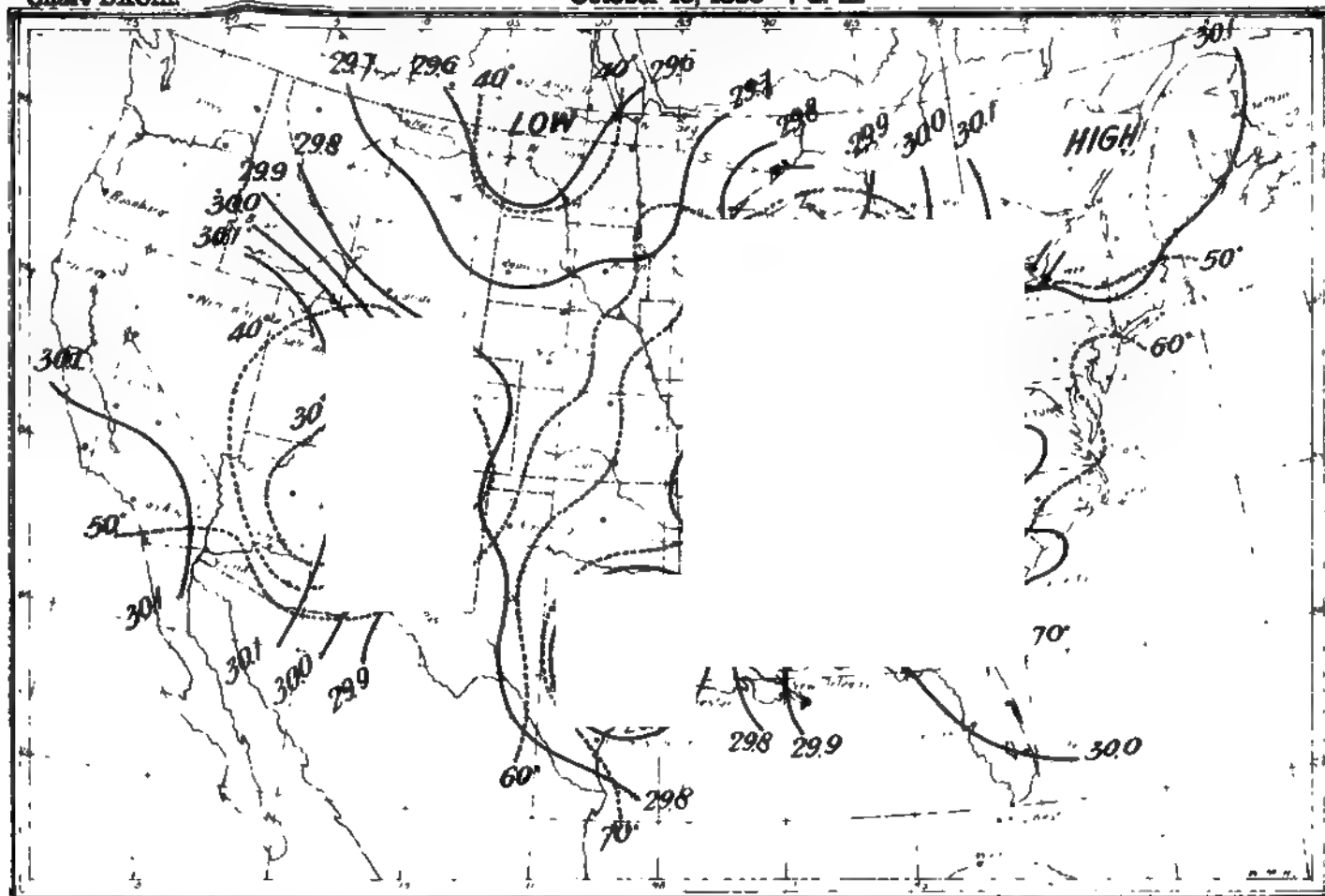


Chart DXCII.

October 29, 1885—3 p. m.





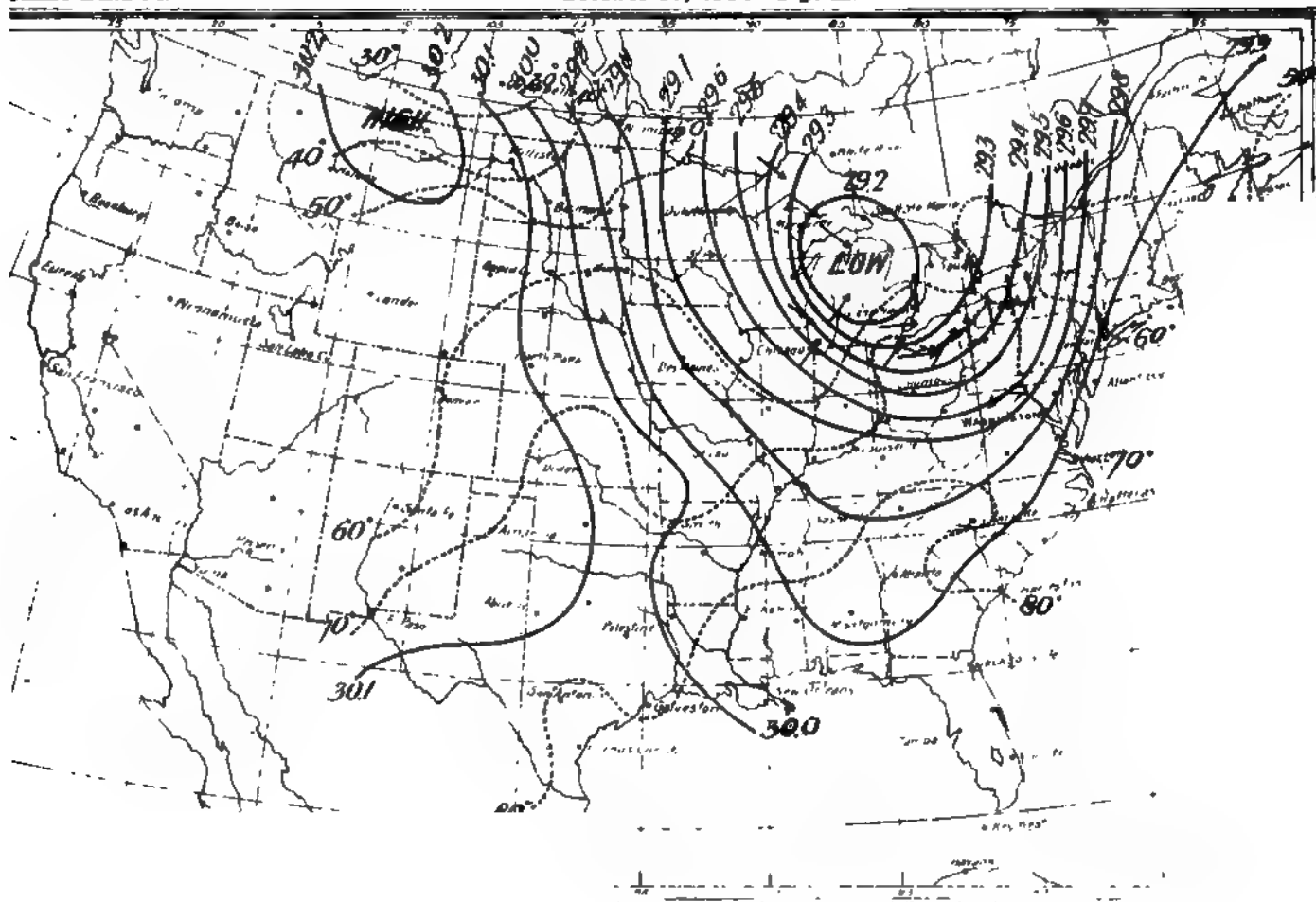


Chart DXOVII.

October 1, 1887—3 p. m.

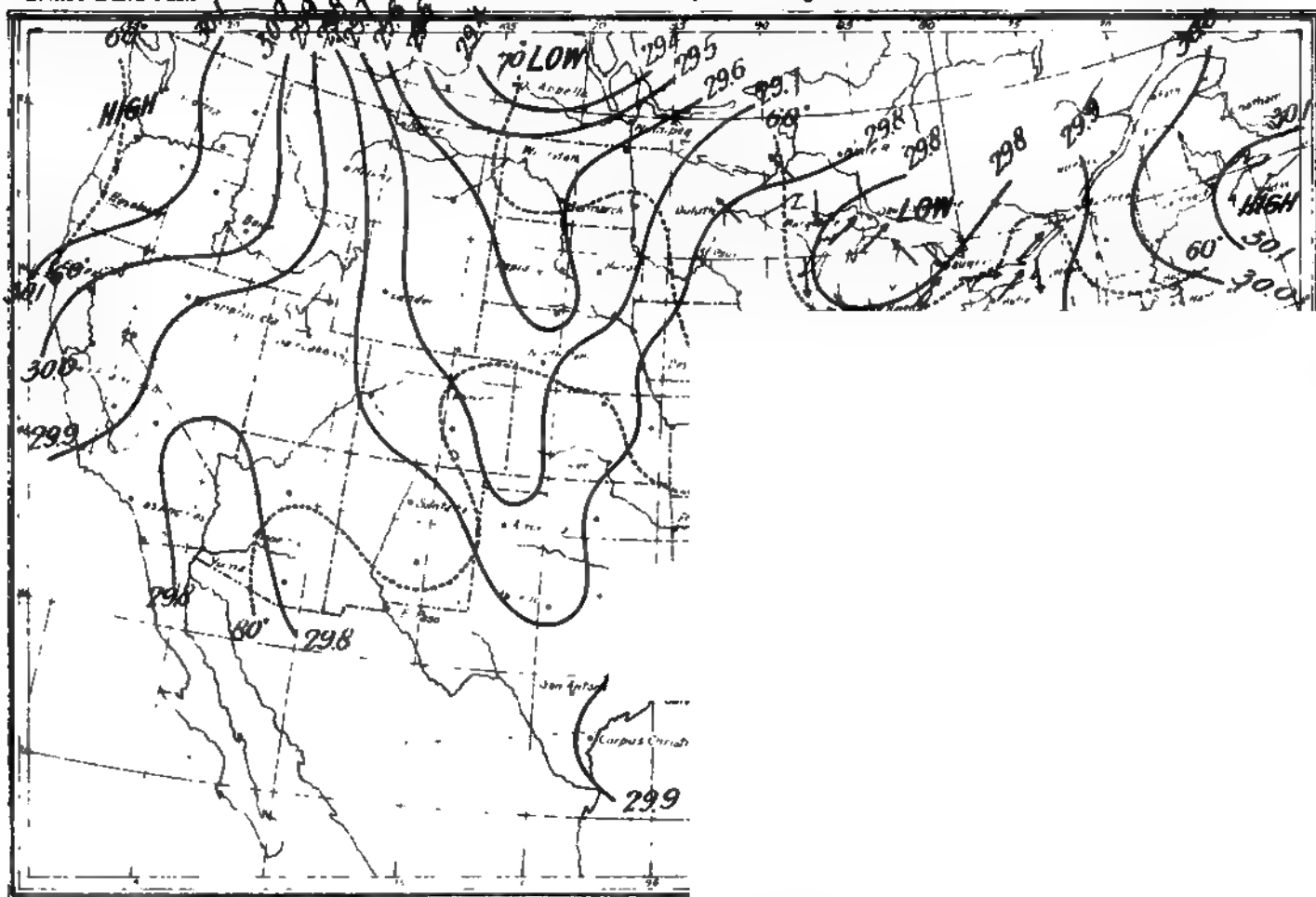


Chart DXOVIII.

October 2, 1887—7 a. m.

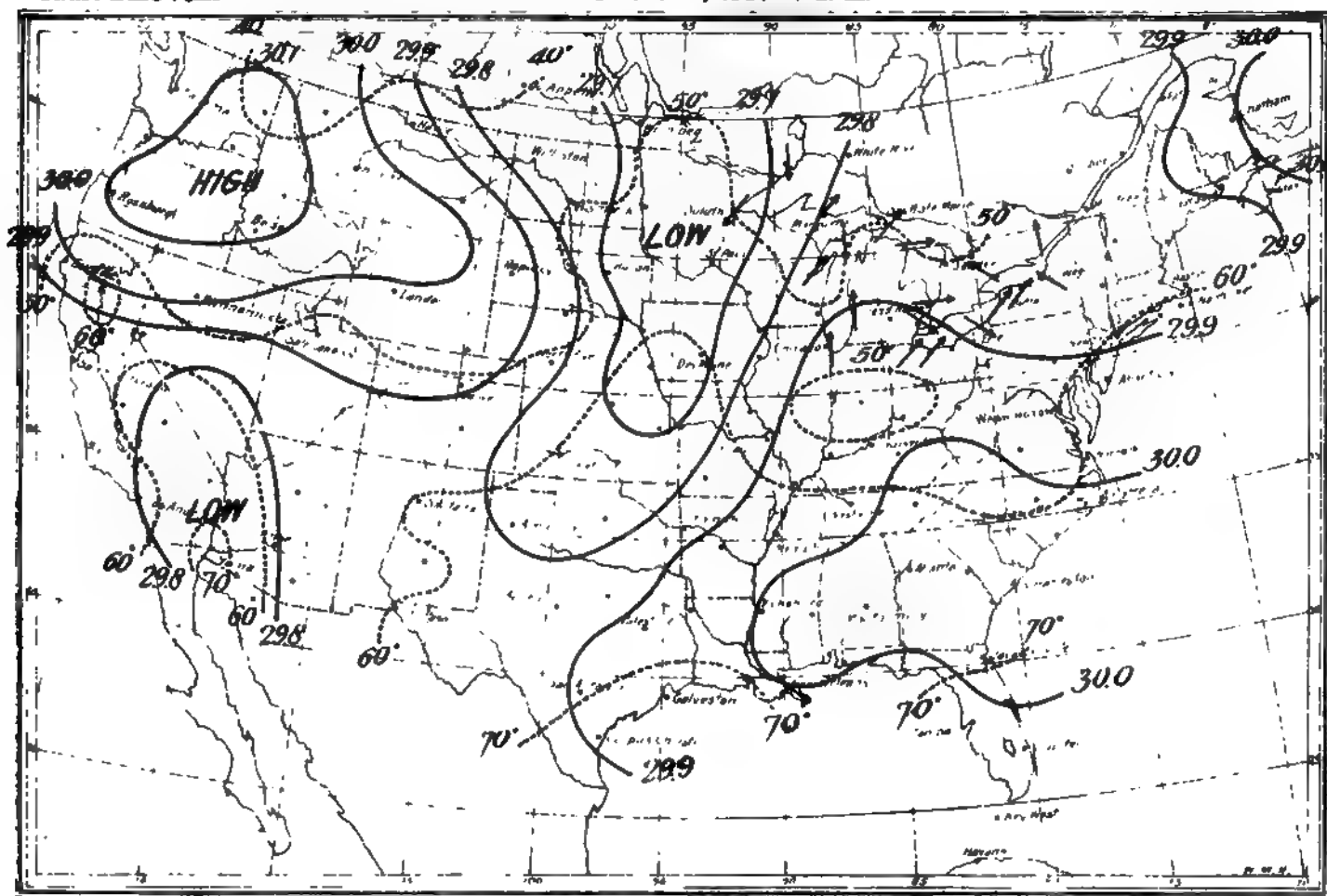


Chart DXOIX.

October 2, 1887—3 p. m.

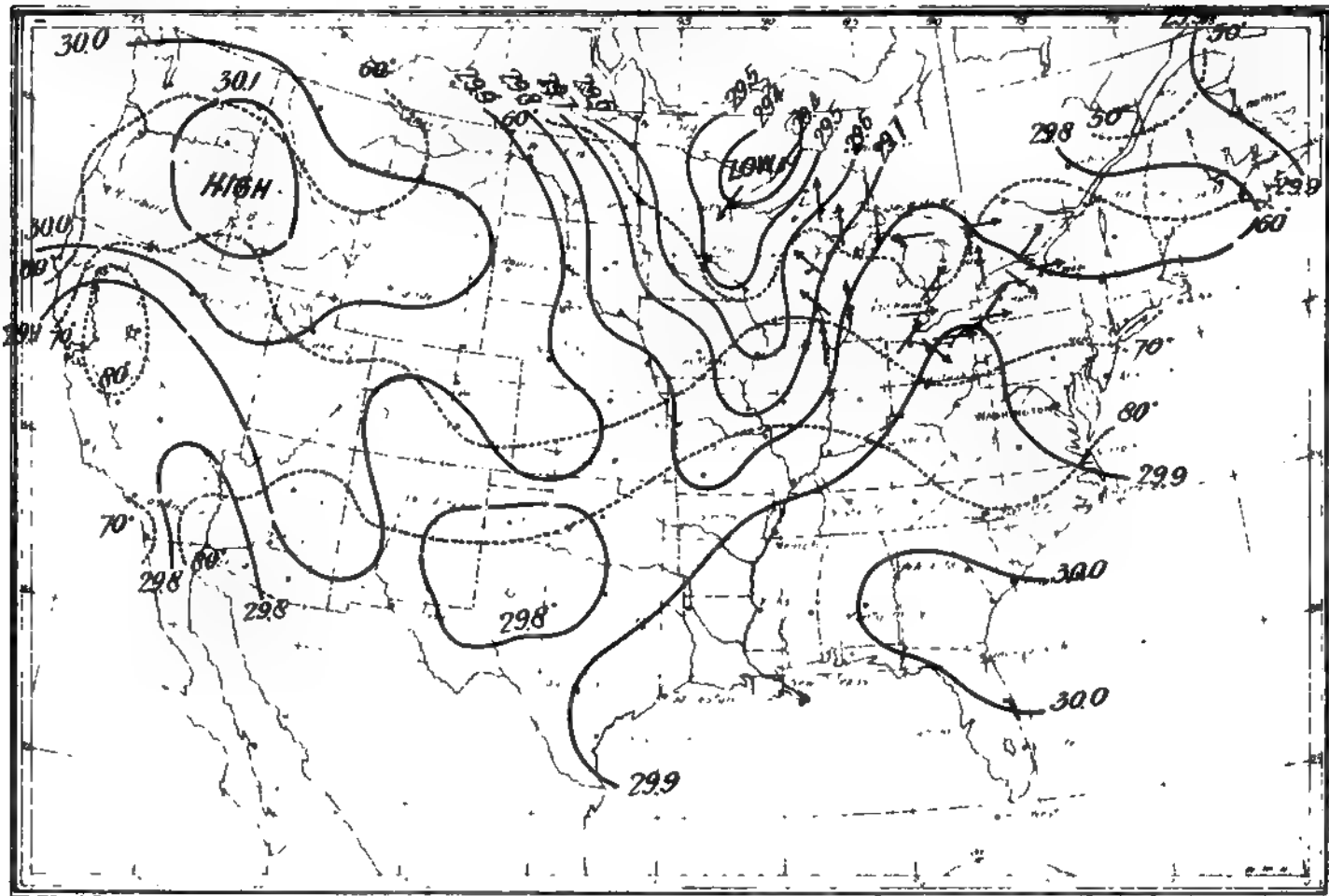


Chart DC.

October 3, 1887—7 a. m.

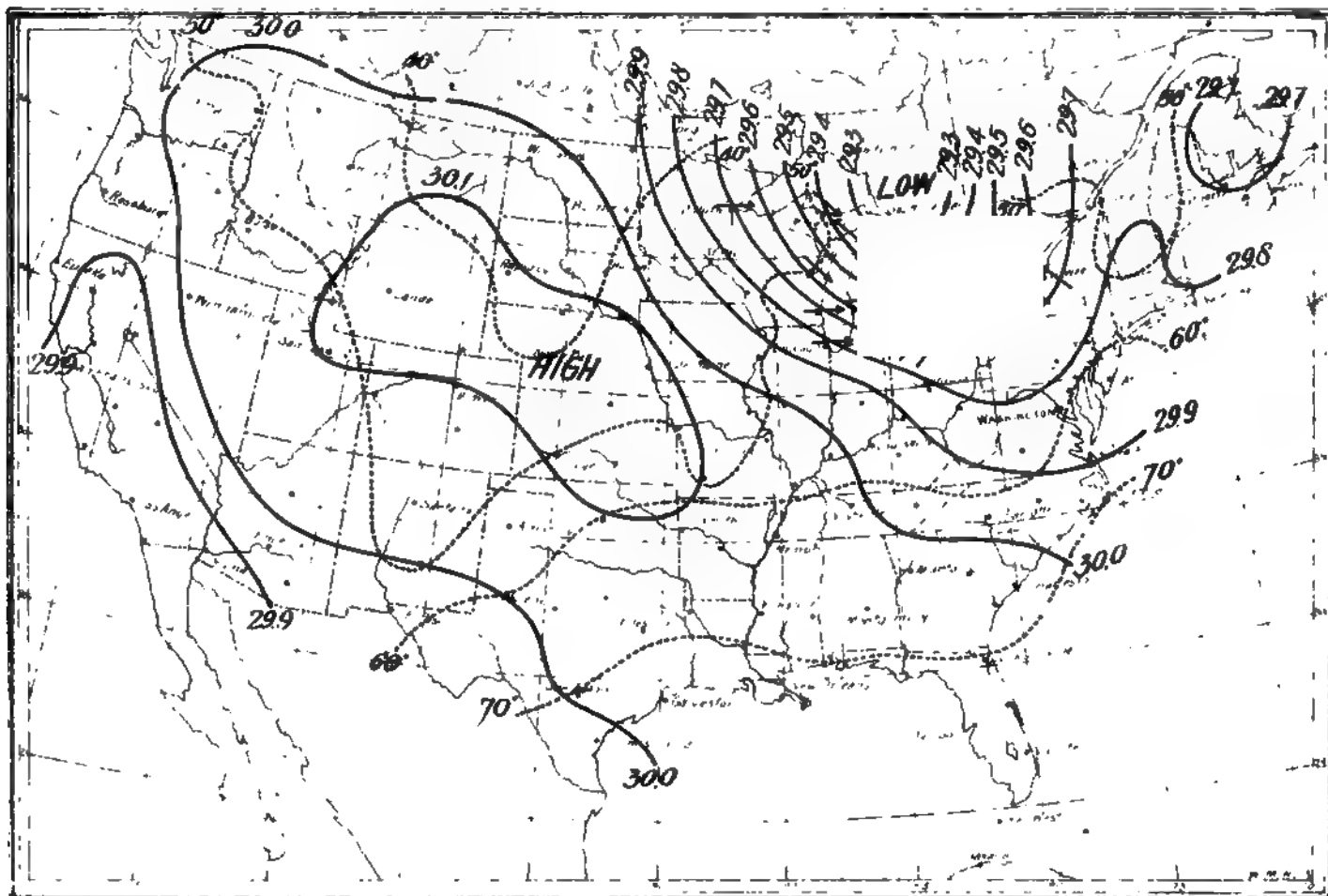


Chart DCL

October 22, 1887—8 p. m.

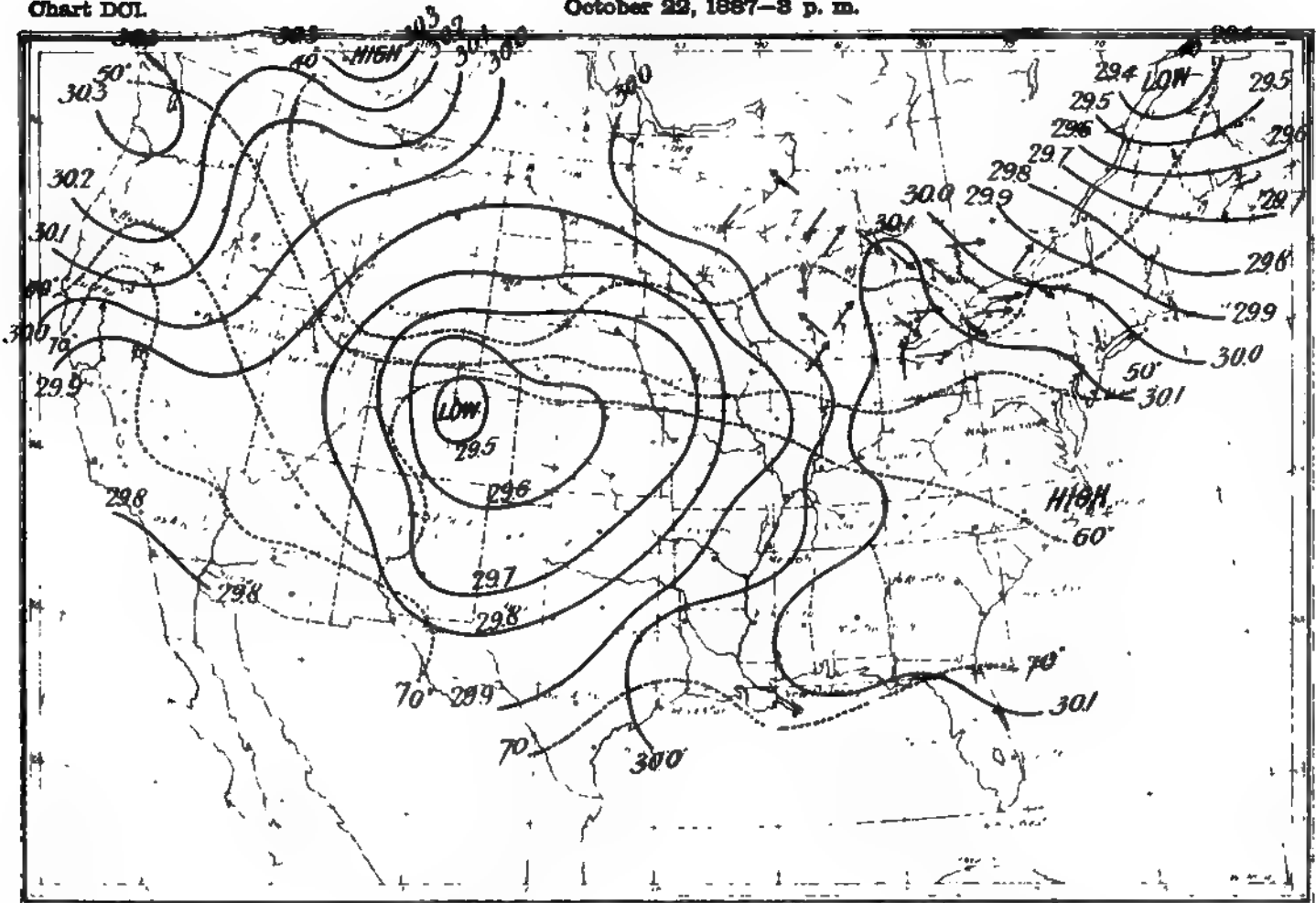


Chart DCL

October 22, 1887—7 a. m.

Chart DCM.

October 23, 1887-8 p. m.

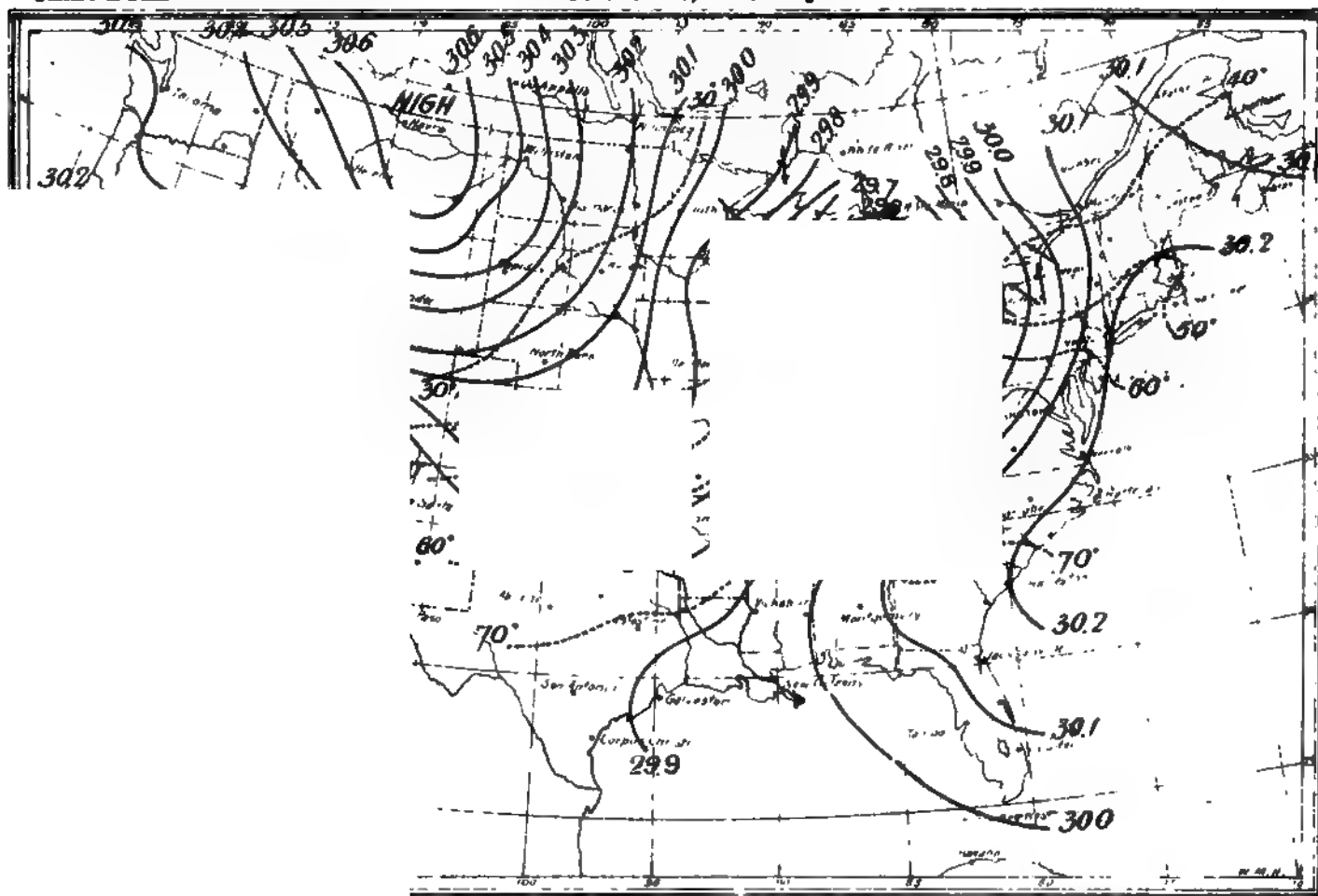


Chart DOTV.

October 24, 1887—7 a. m.

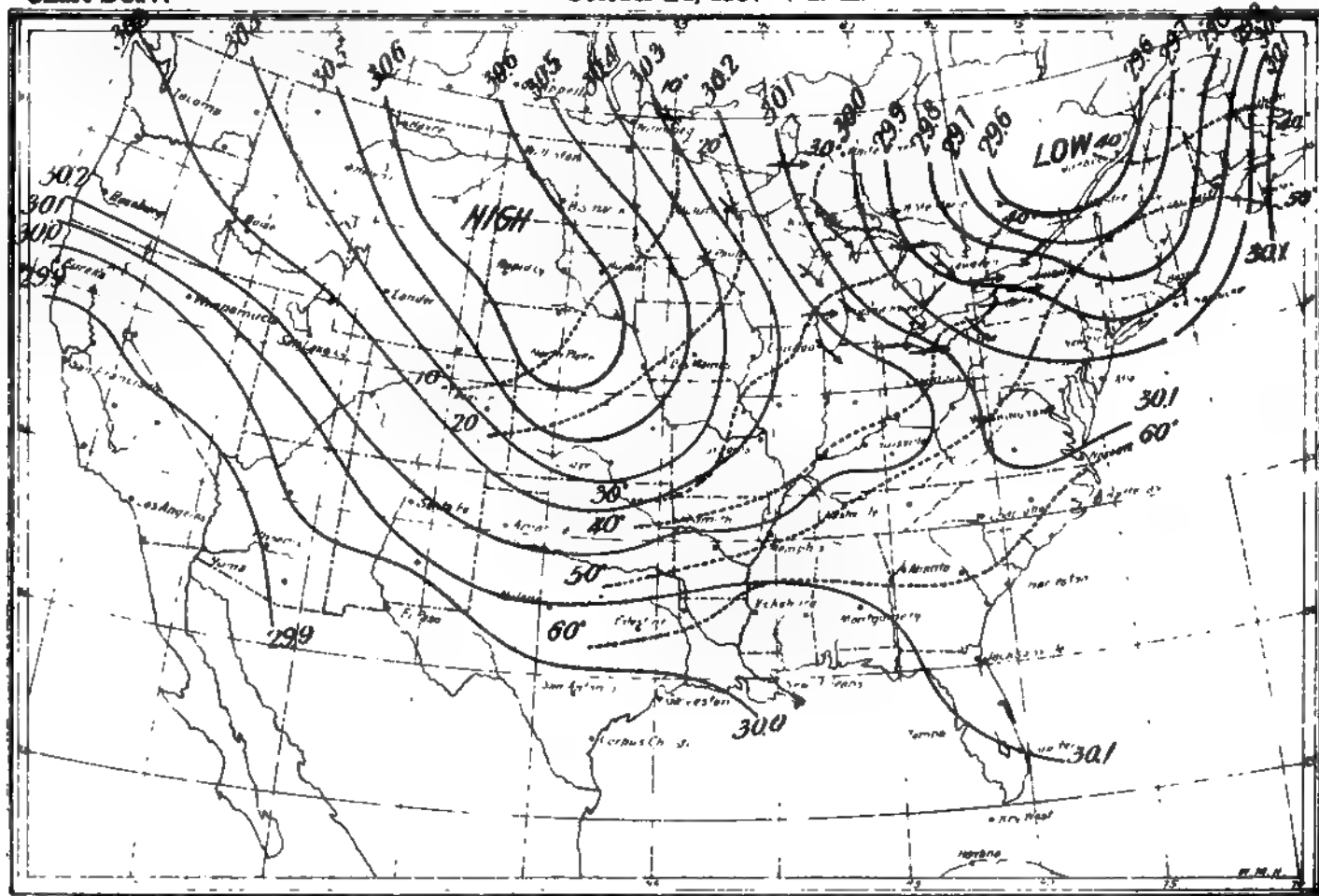


Chart DOV.

October 4, 1889—8 a. m.

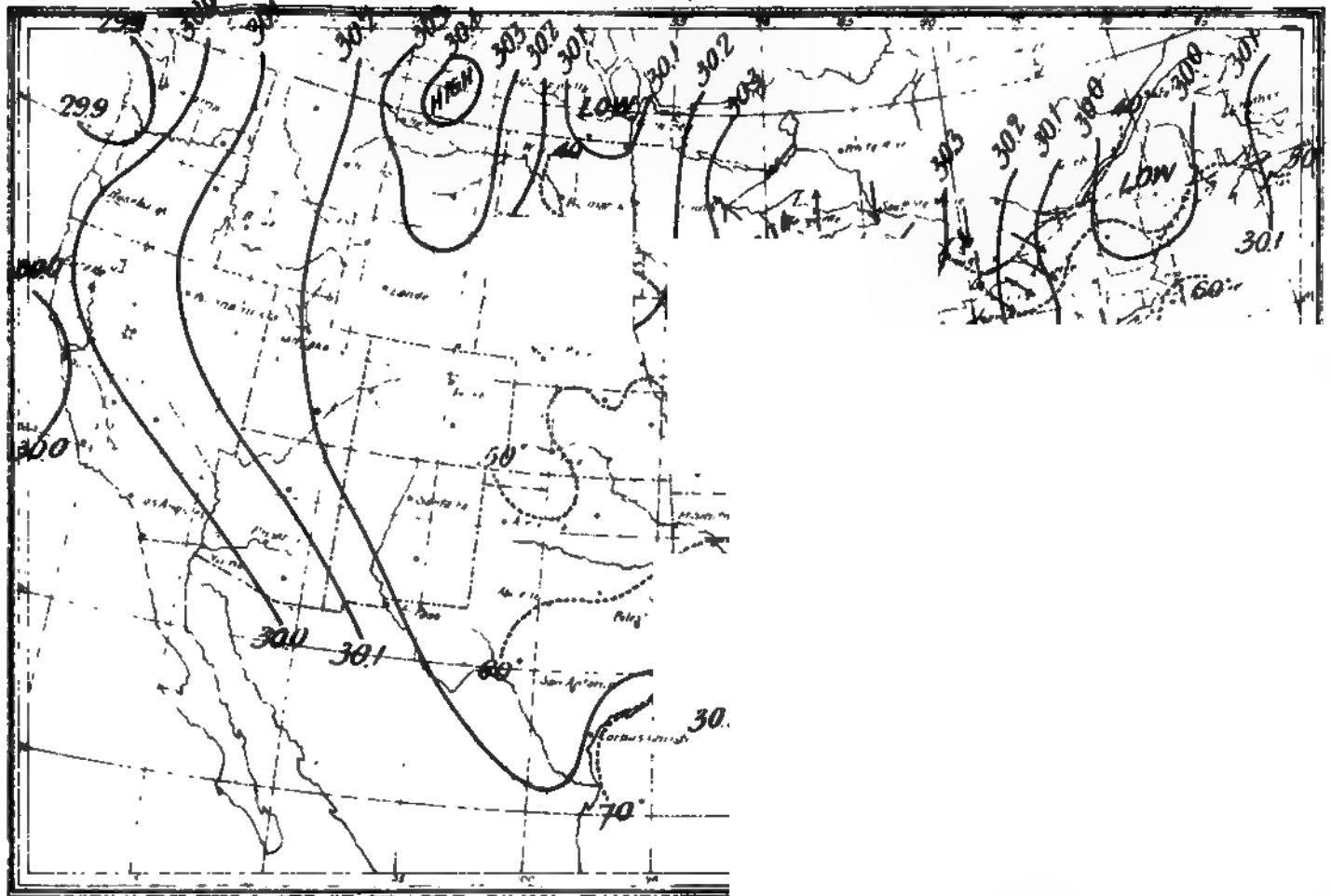


Chart DOVI.

October 4, 1889—8 p. m.

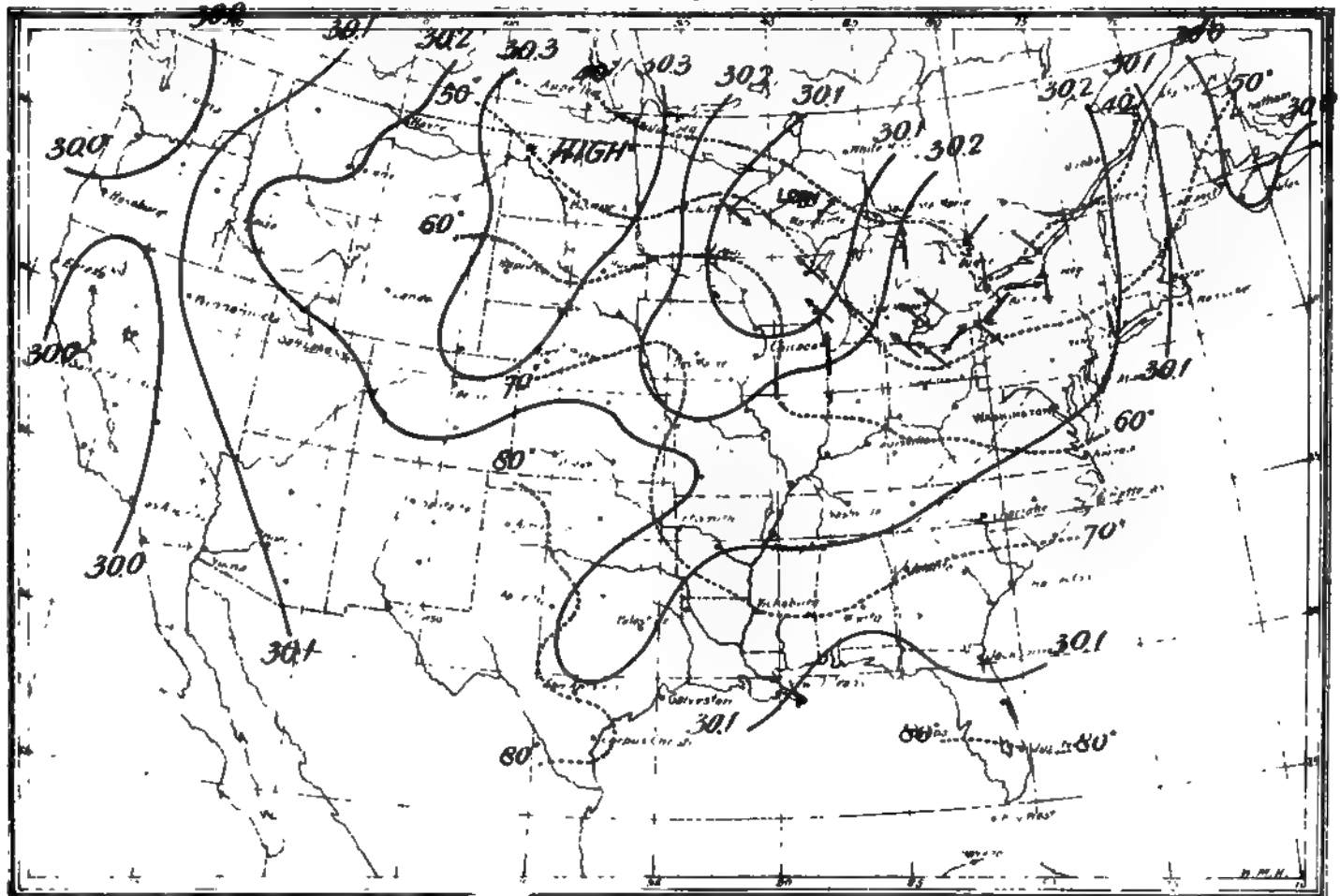


Chart DOVII.

October 5, 1889—6 a. m.

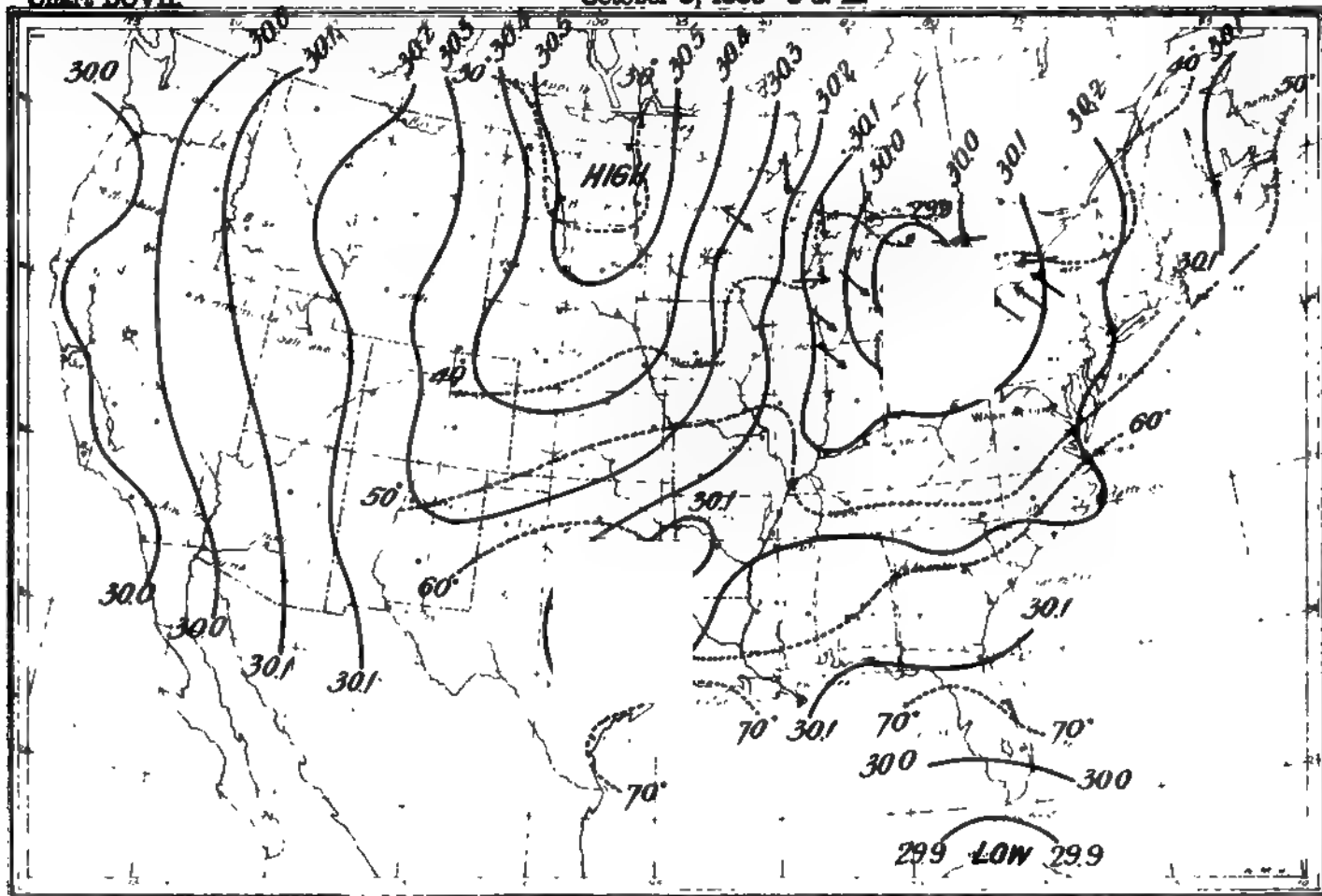


Chart DOVIII.

October 5, 1889—8 p. m.

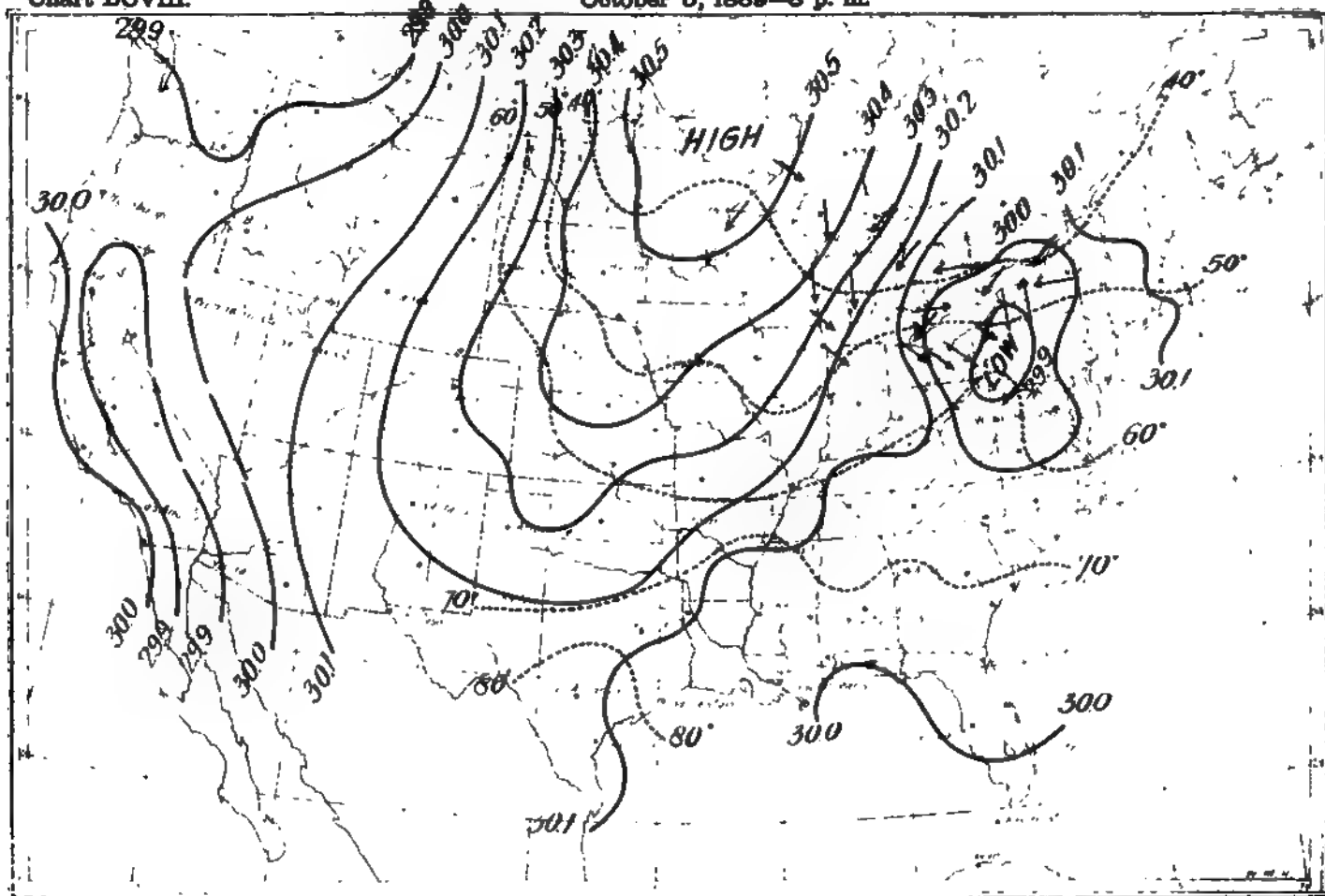


Chart DOIX.

October 12, 1890—8 a. m.

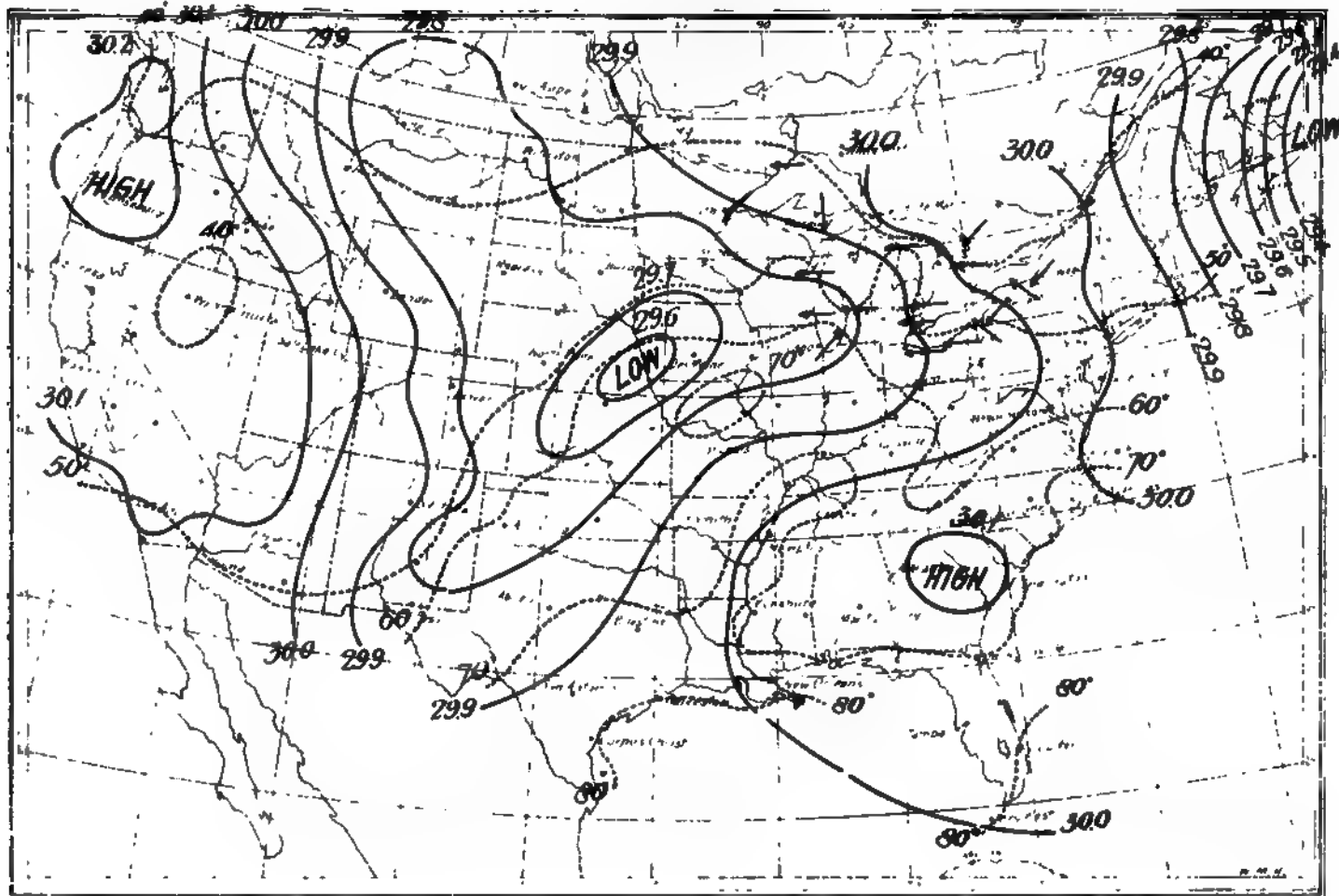


Chart DOIX.

October 12, 1890—8 p. m.

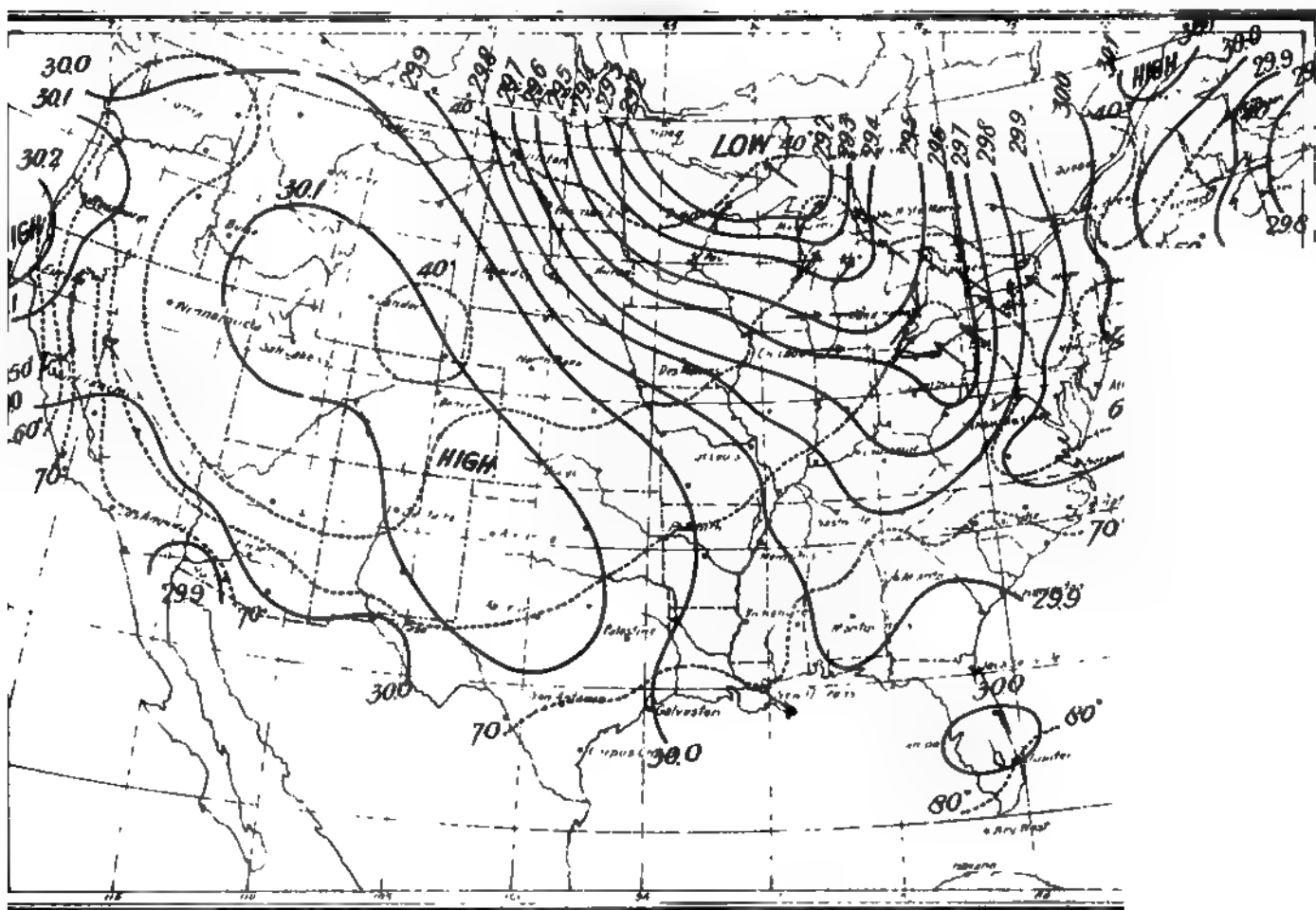
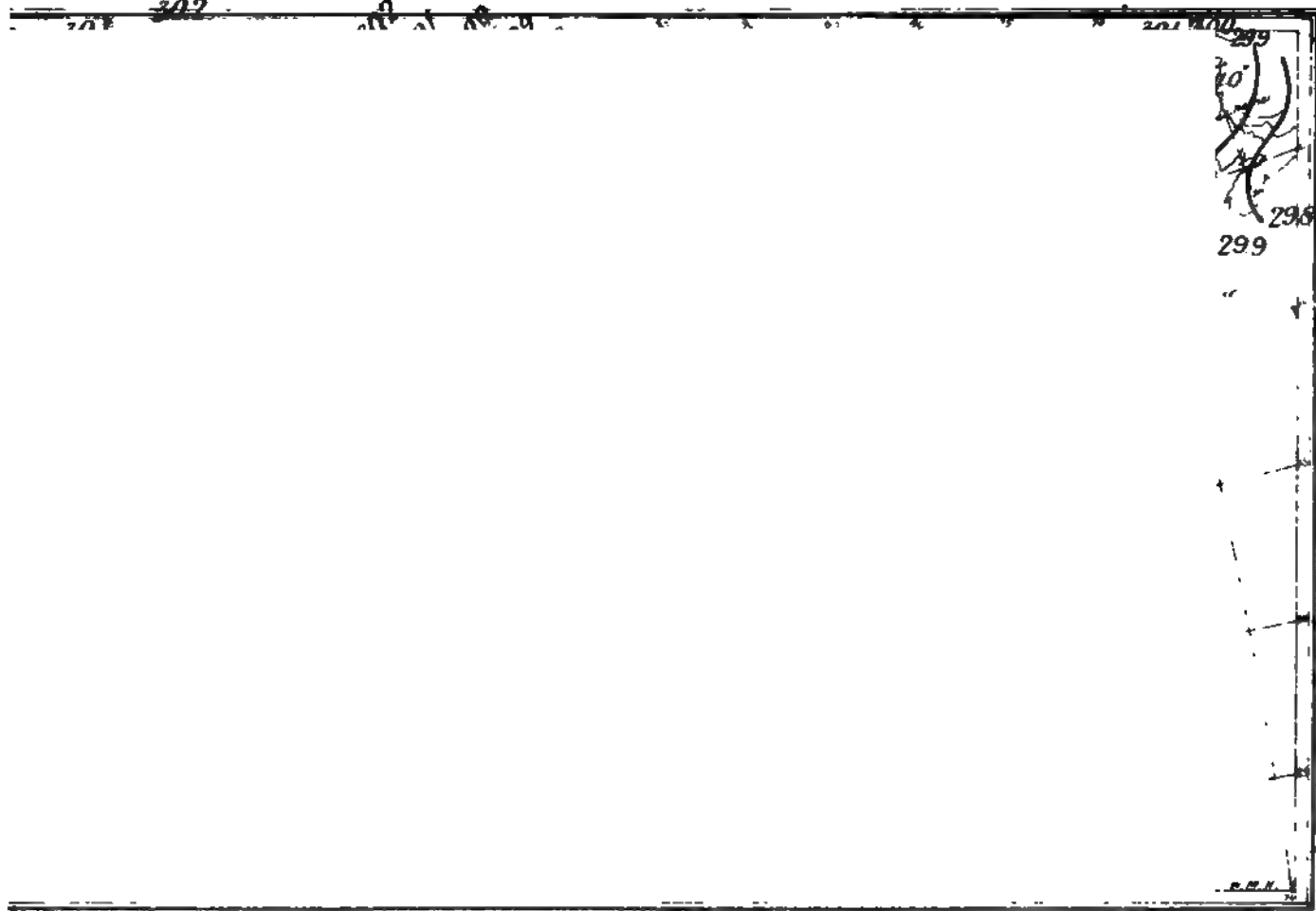


Chart DOXIII.

October 24, 1891—8 p. m.

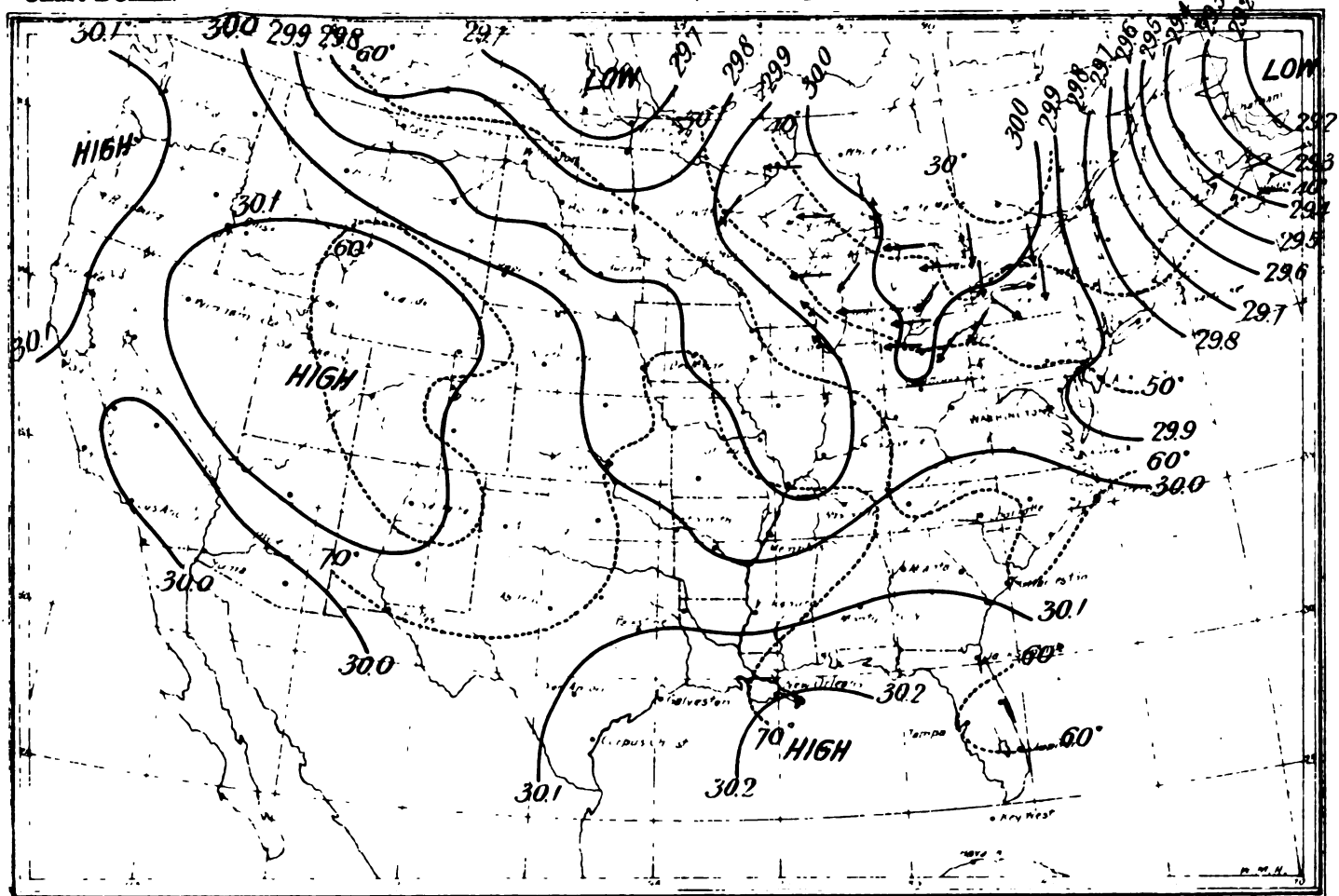


Chart DOXIV.

October 25, 1891—8 a. m.

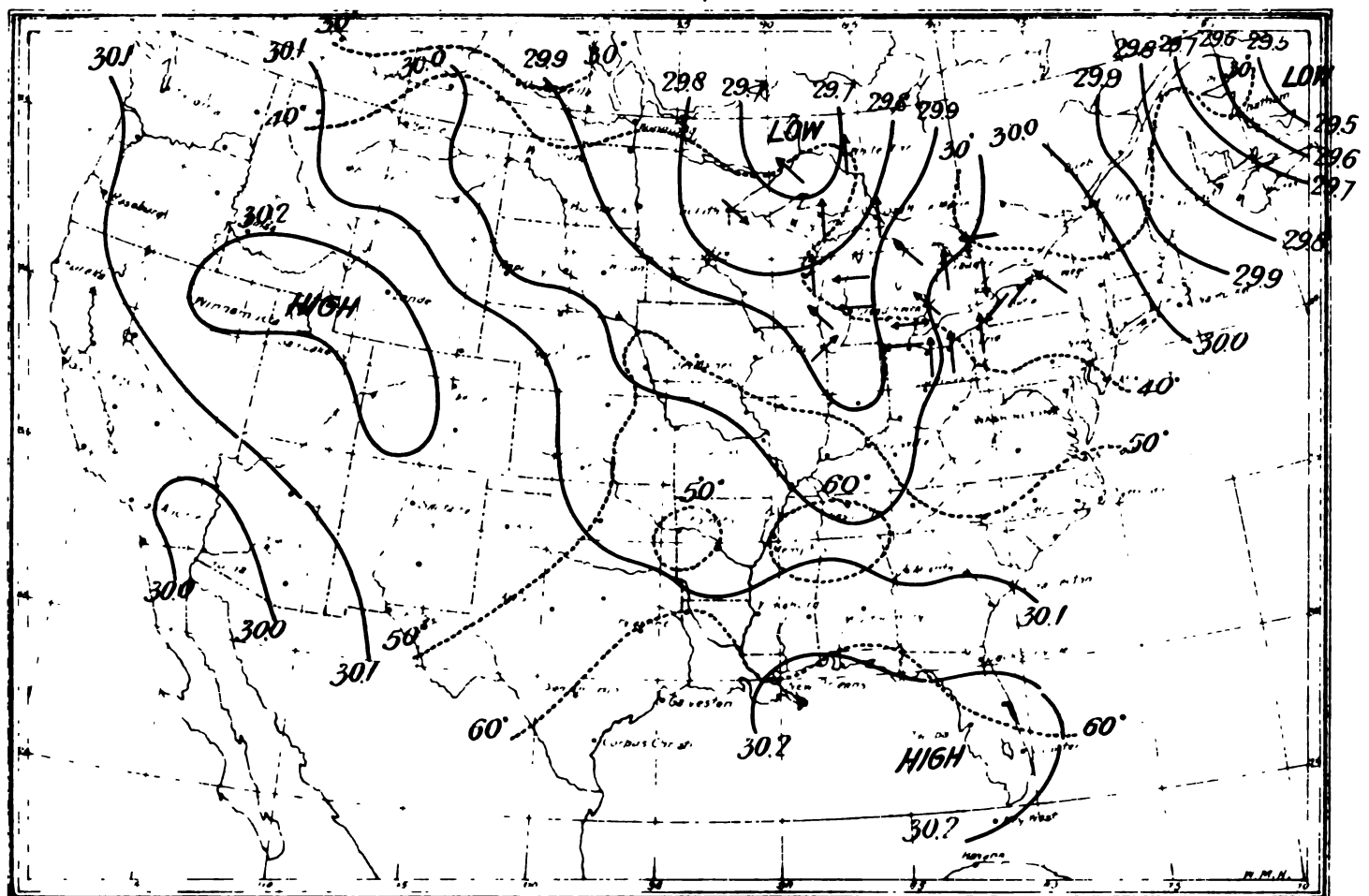


Chart DOXV.

October 25, 1891—8 p. m.

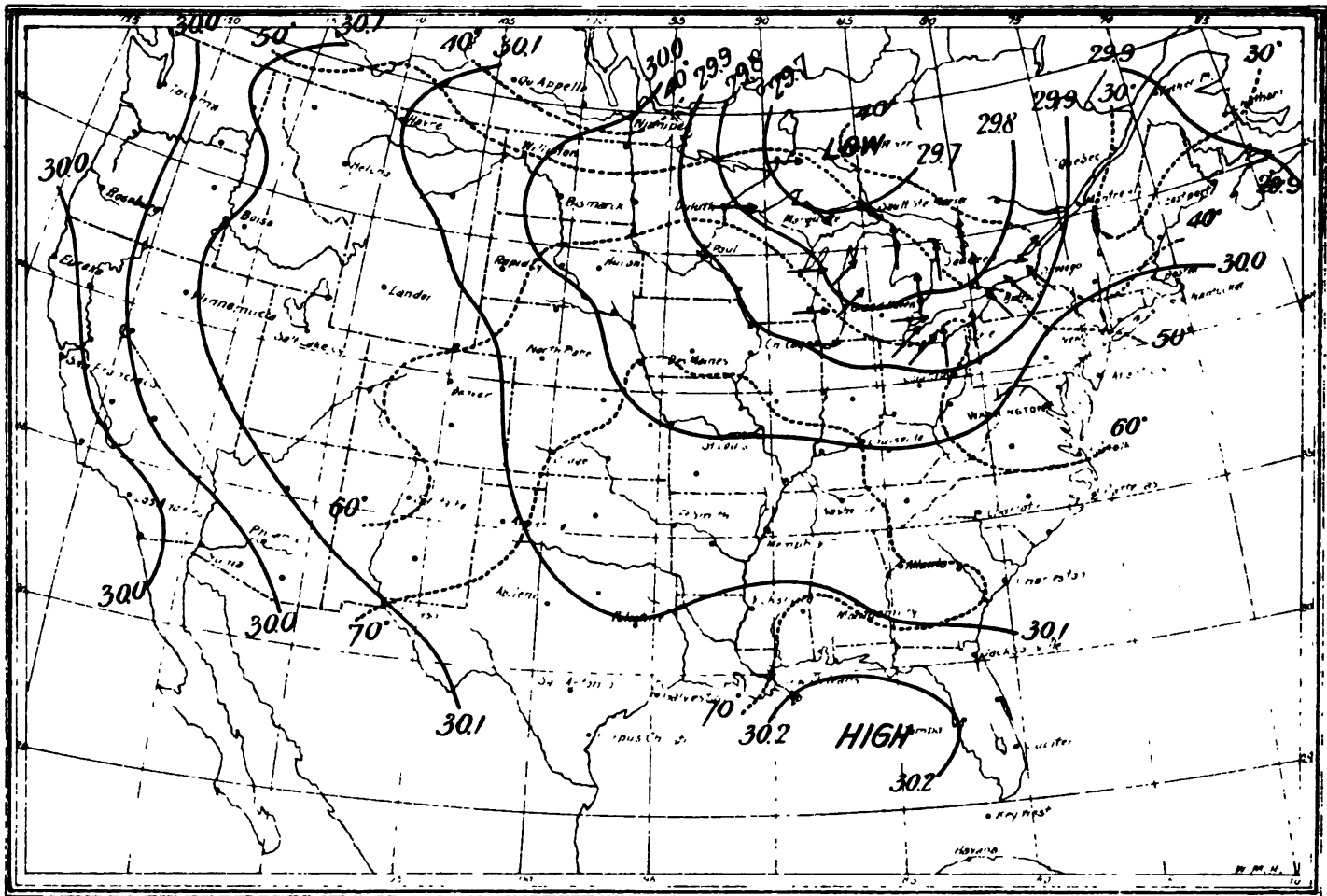


Chart DOXVI.

October 26, 1891—8 a. m.

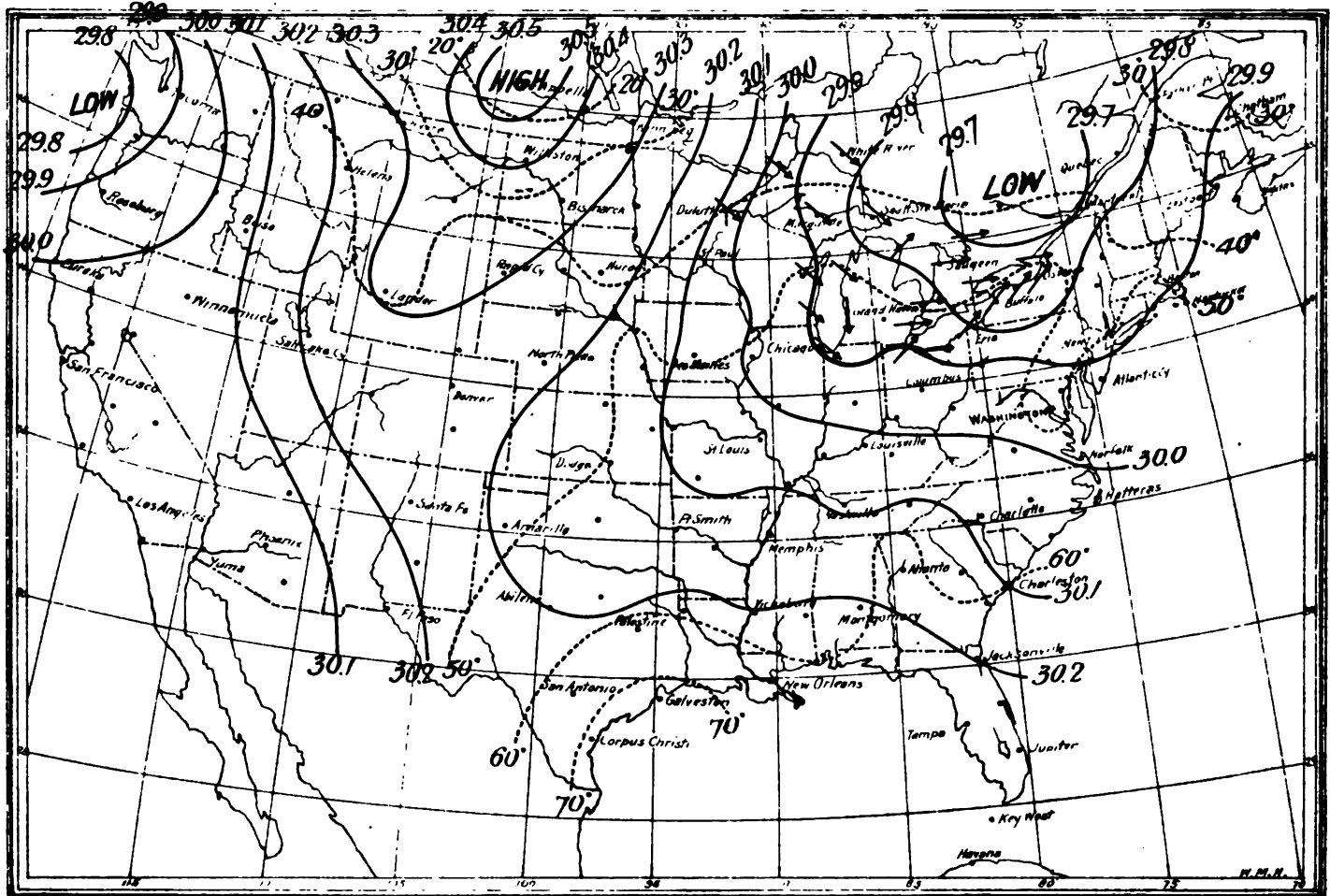


Chart DOXVII

October 30, 1891—8 a. m.

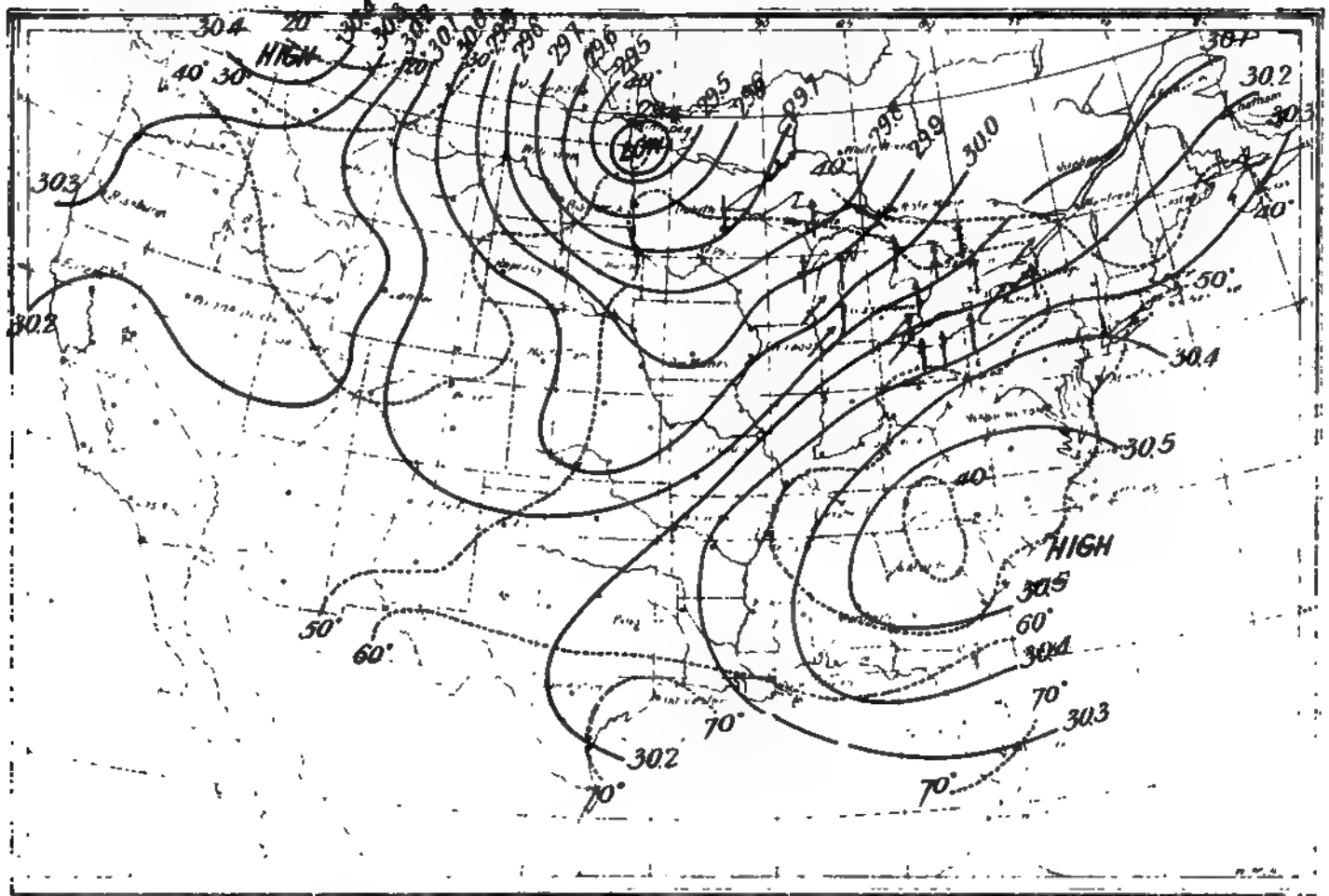


Chart DOXVIII

October 30, 1891—9 p. m.

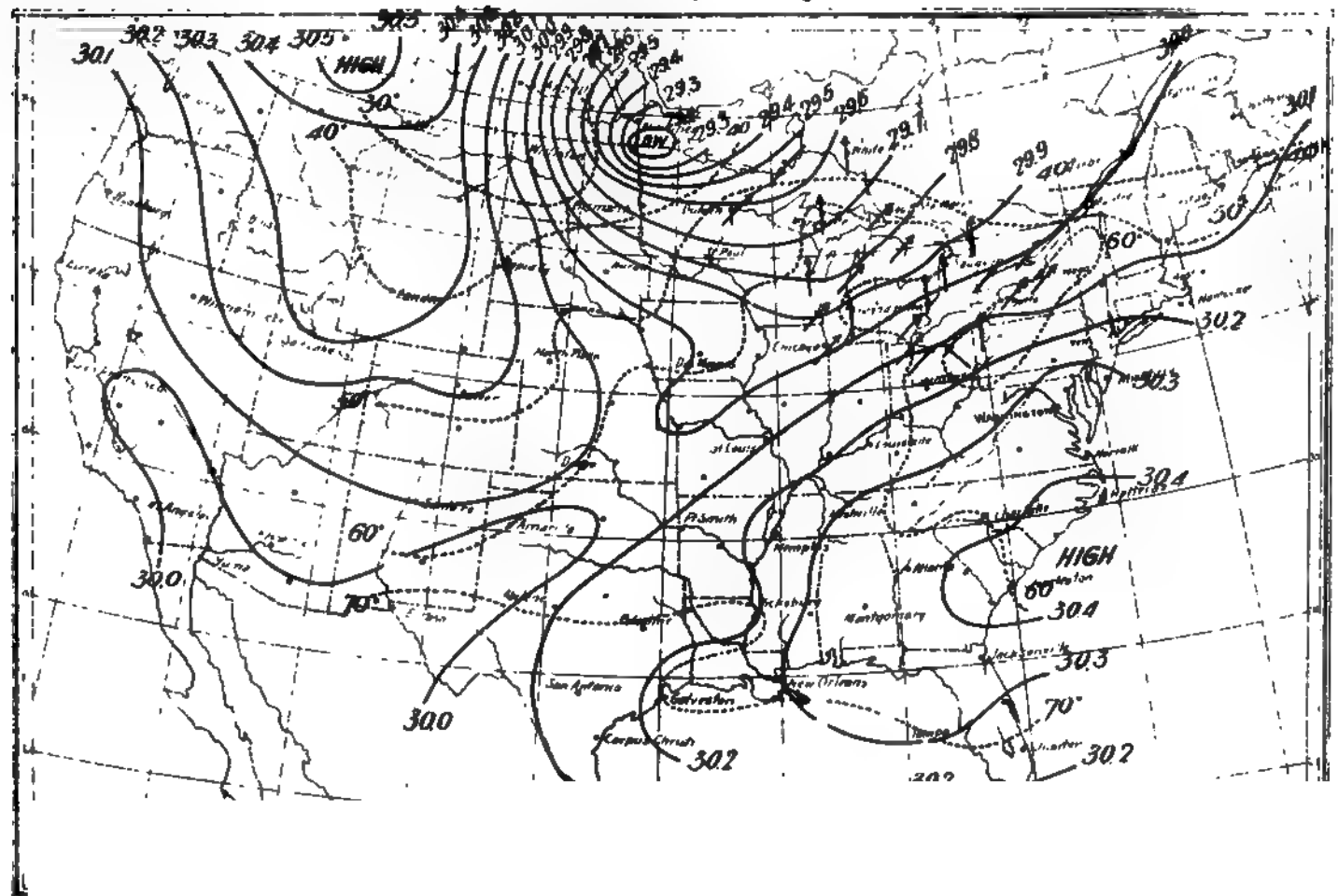


Chart DOXIX.

October 31, 1891—8 a. m.

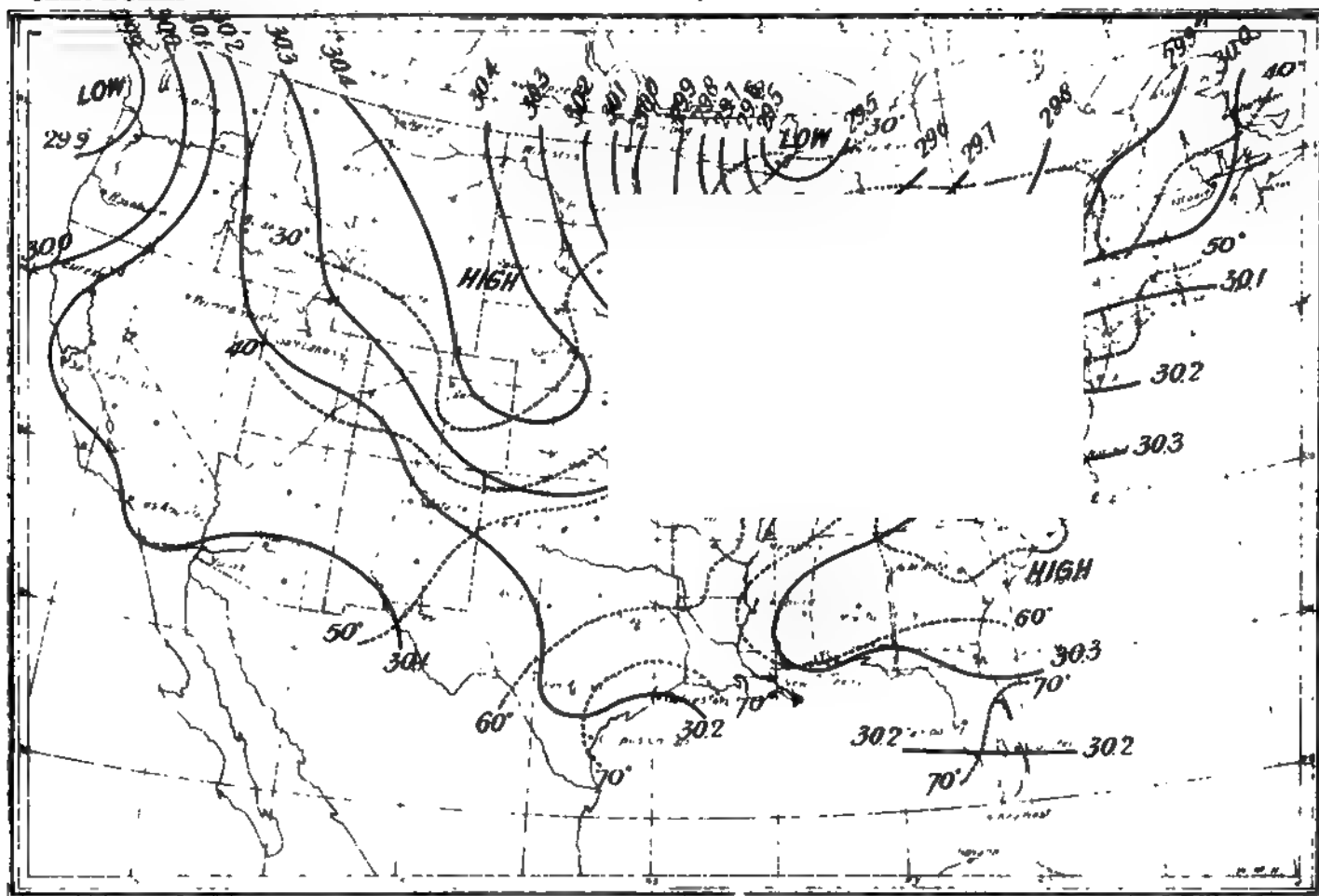


Chart DOXX.

October 31, 1891—8 p. m.

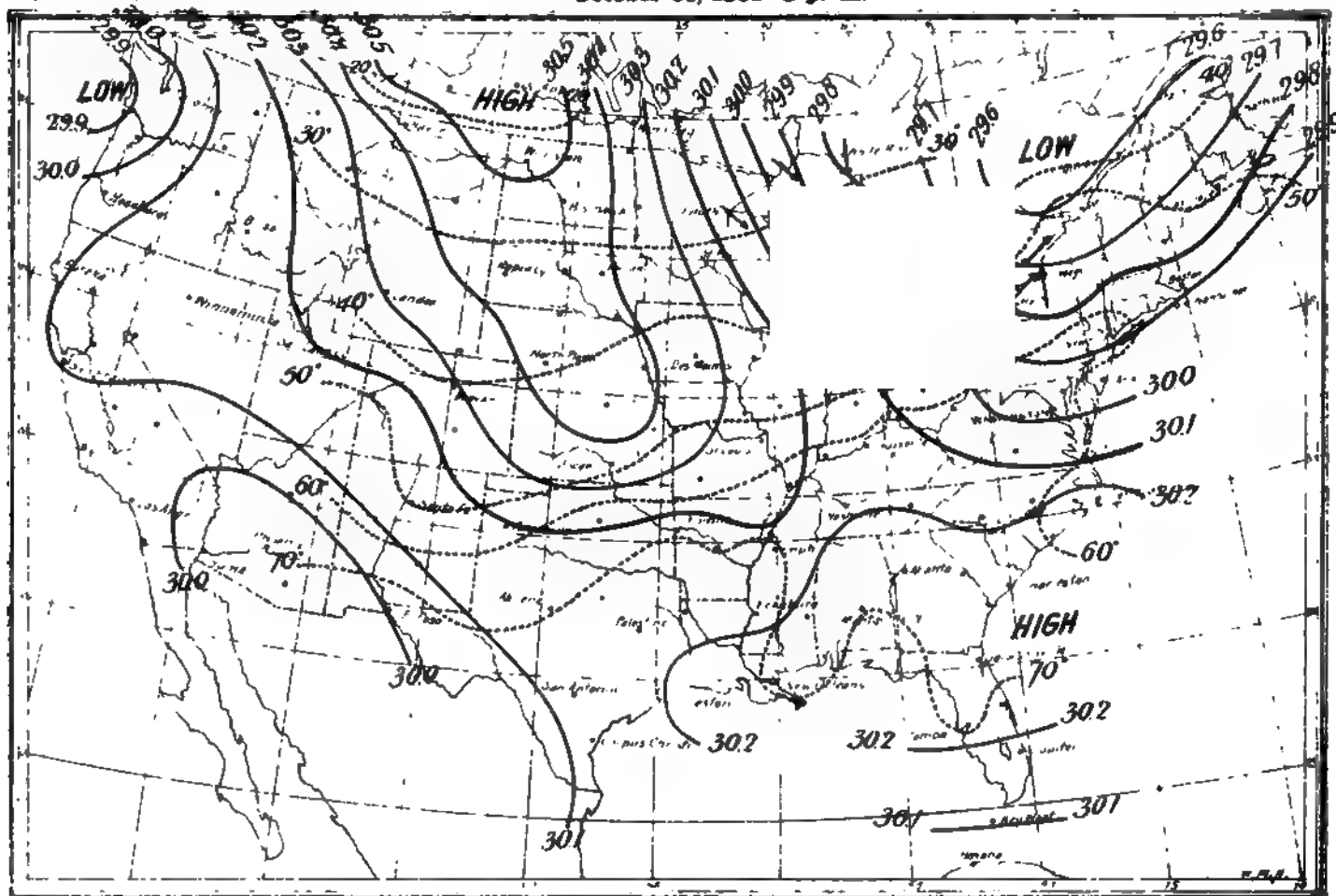


Chart DOXXI.

October 27, 1892—8 p. m.

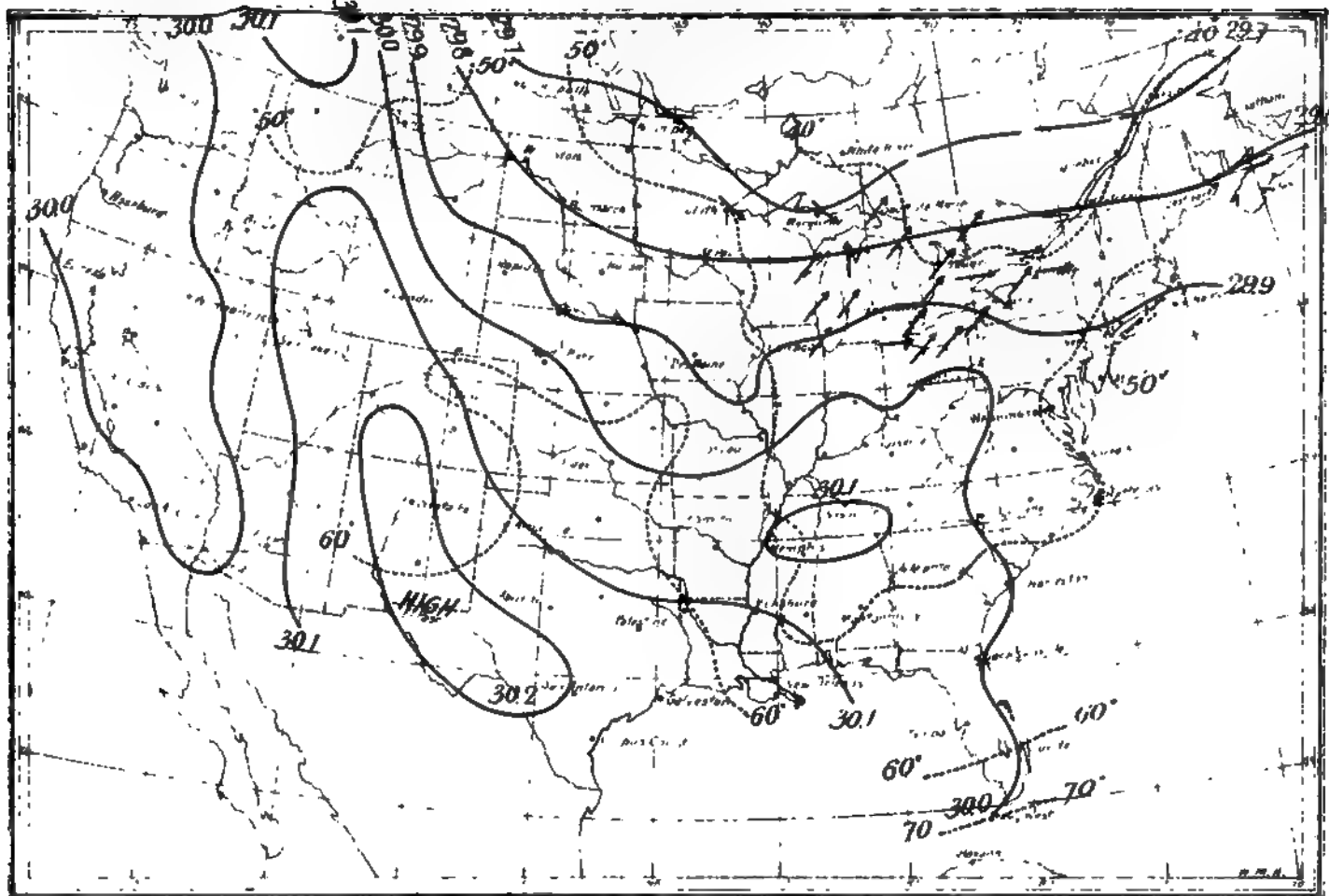


Chart DOXXII.

October 28, 1892—8 a. m.

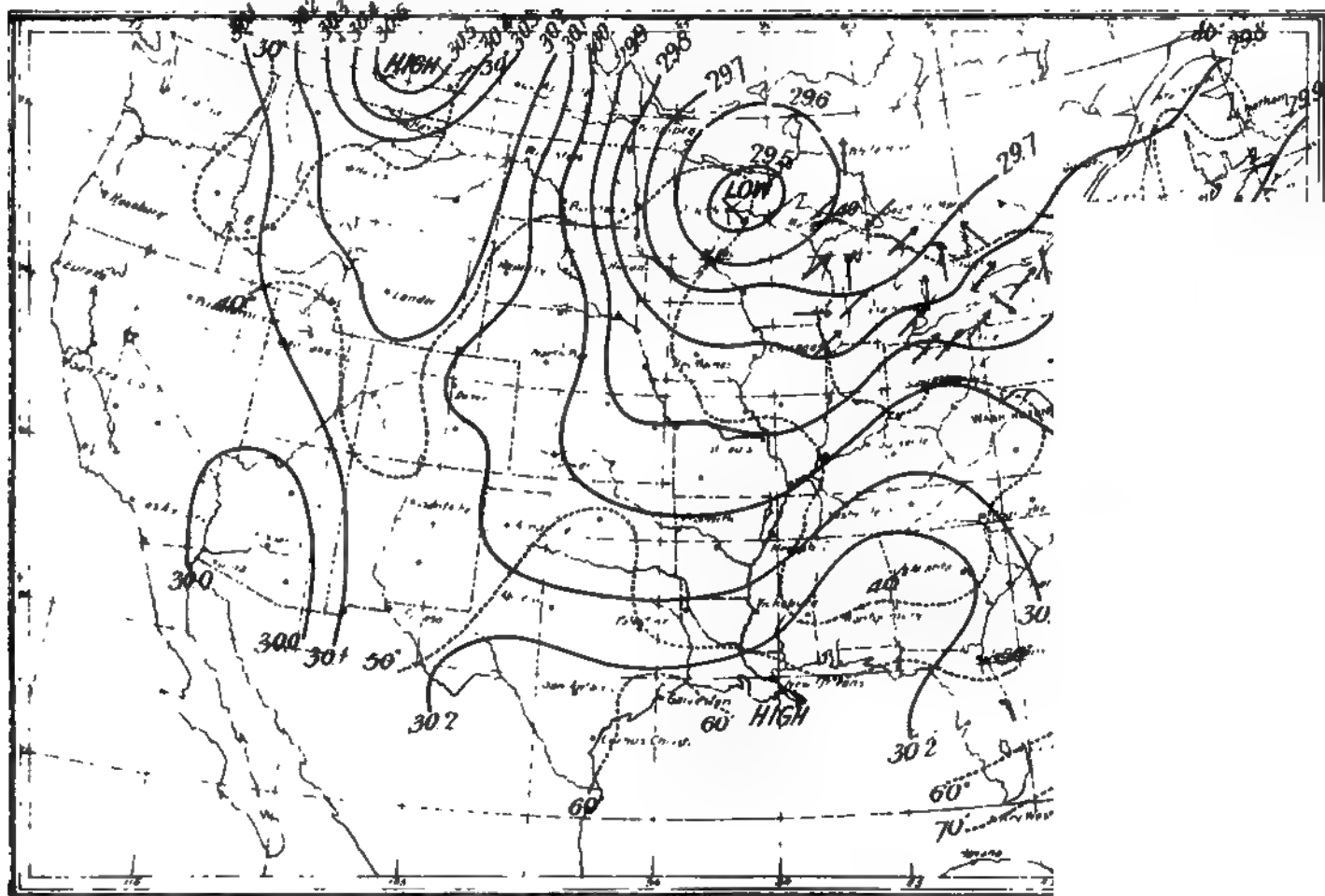


Chart DOXXIII.

October 28, 1892—8 p. m.

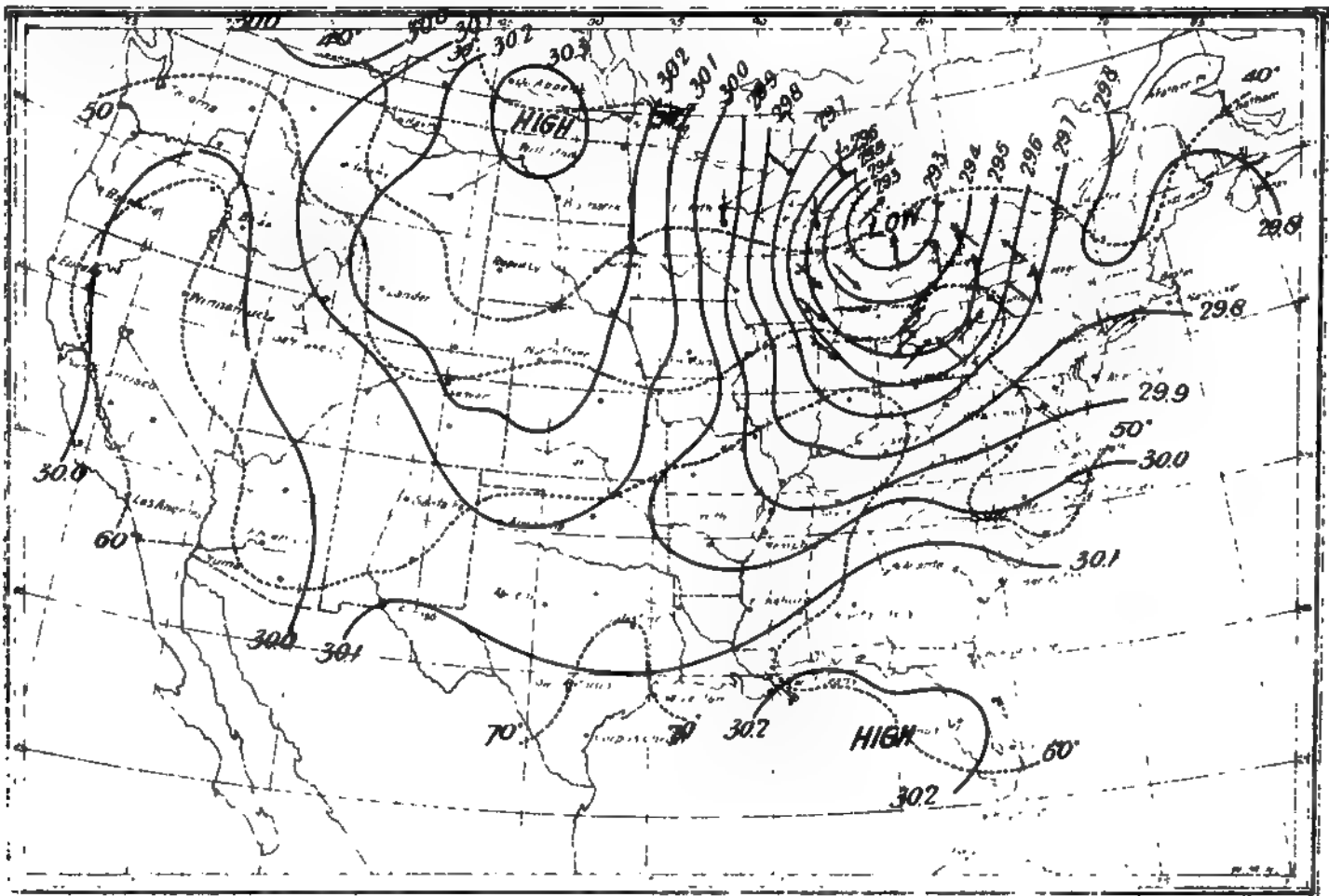


Chart DOXXIV.

October 29, 1892—8 a. m.

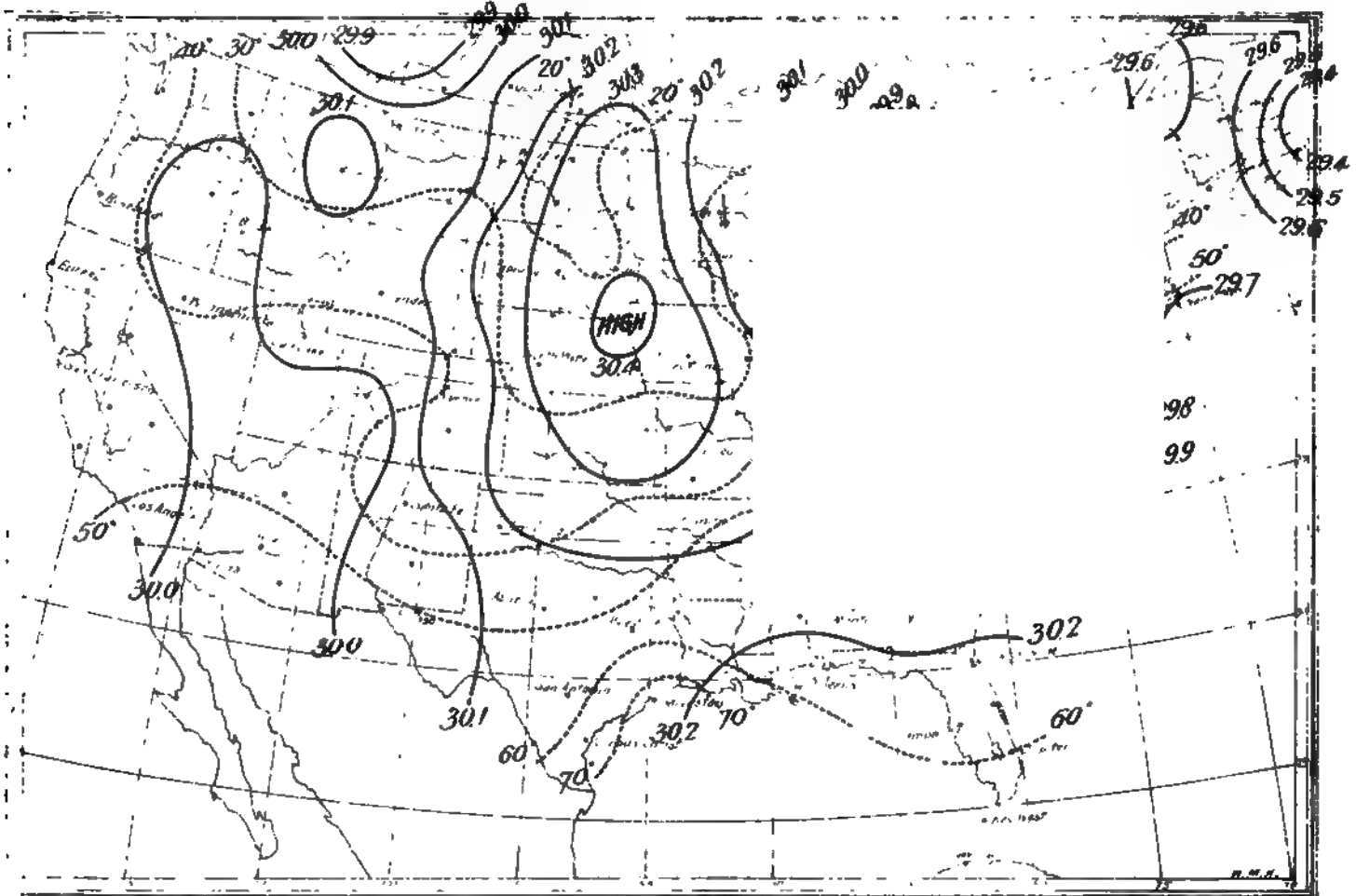


Chart DOXXV.

October 18, 1898—8 a. m.

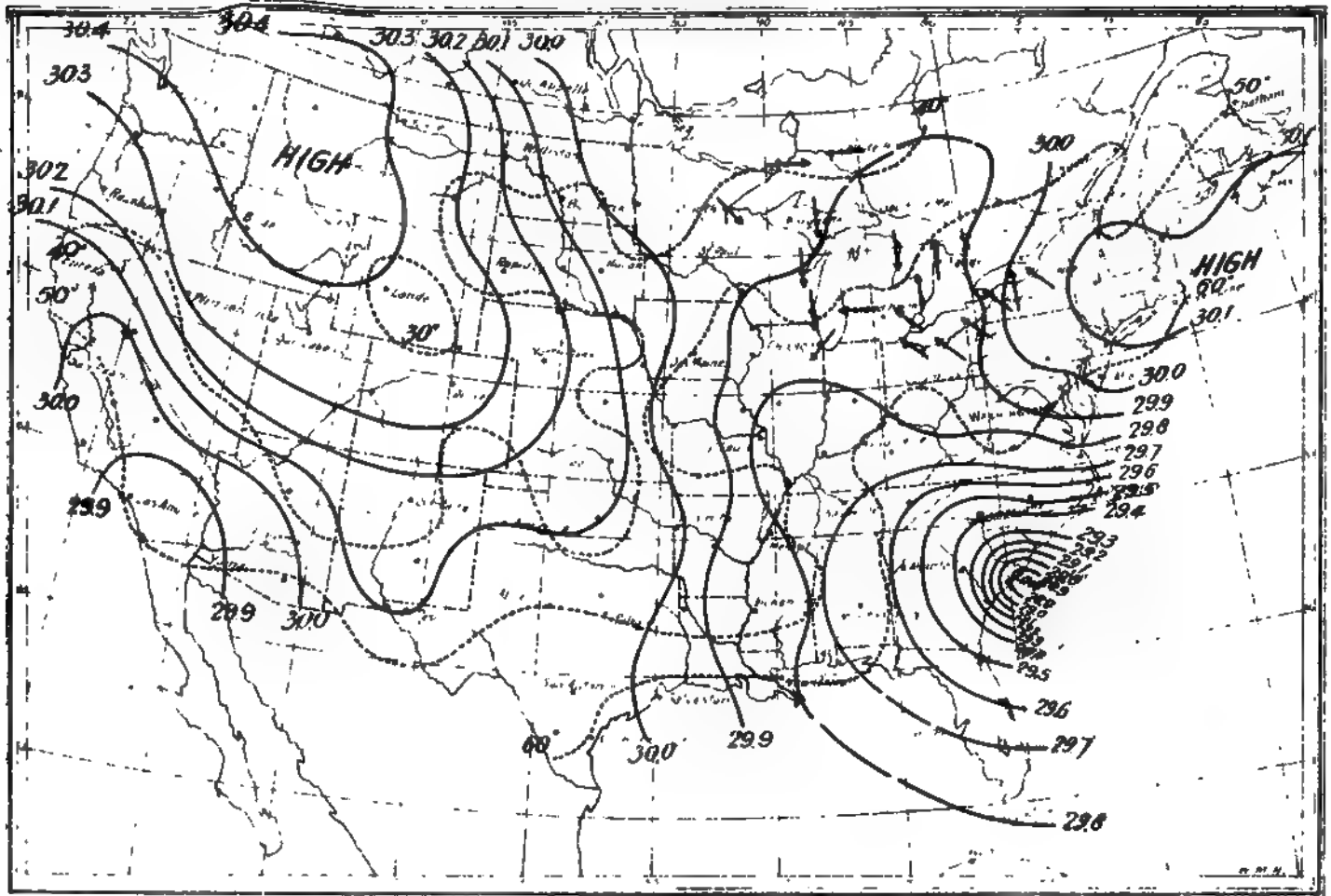


Chart DOXXVI.

October 18, 1898—8 p. m.

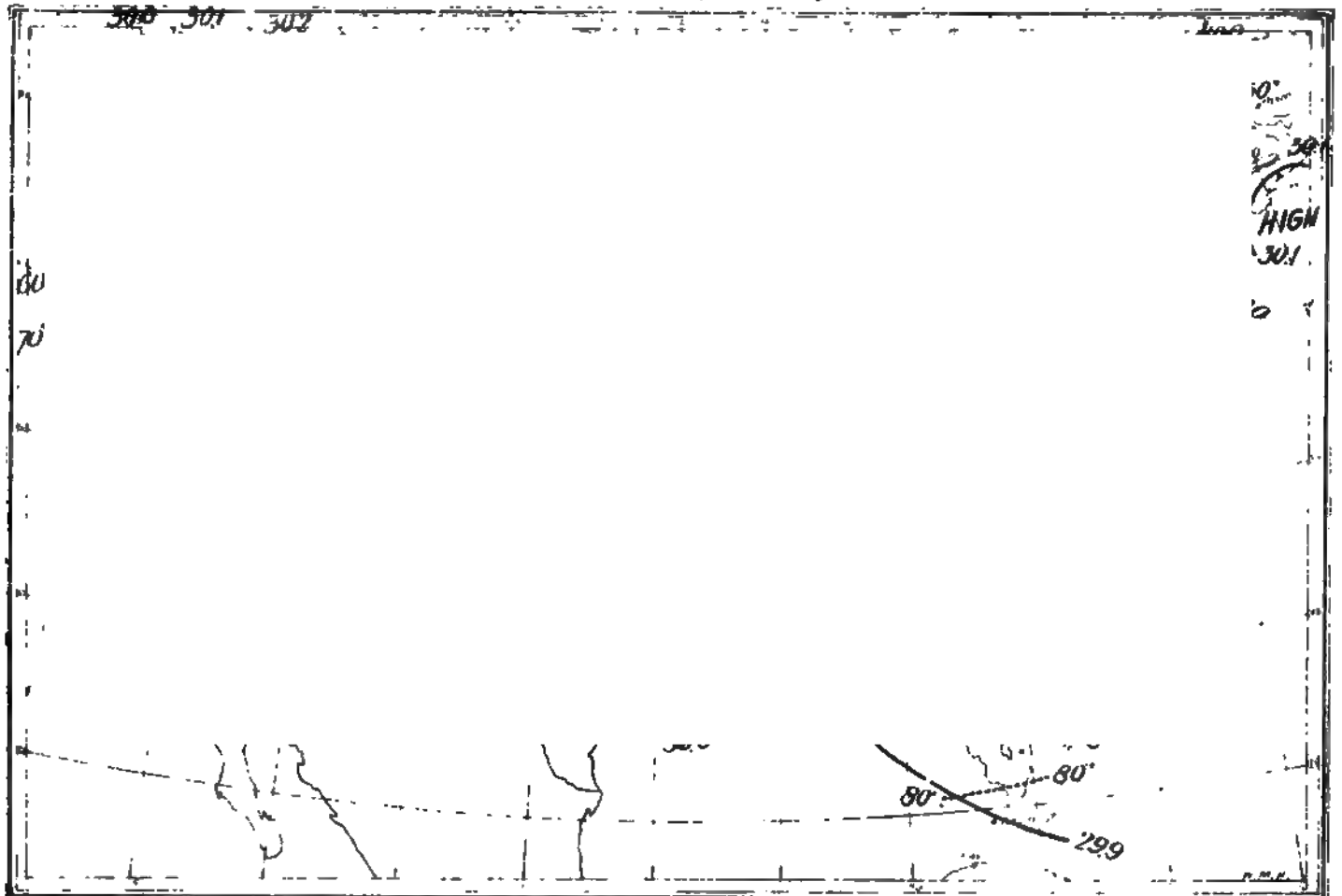


Chart DOXXVII.

October 14, 1898—8 a. m.

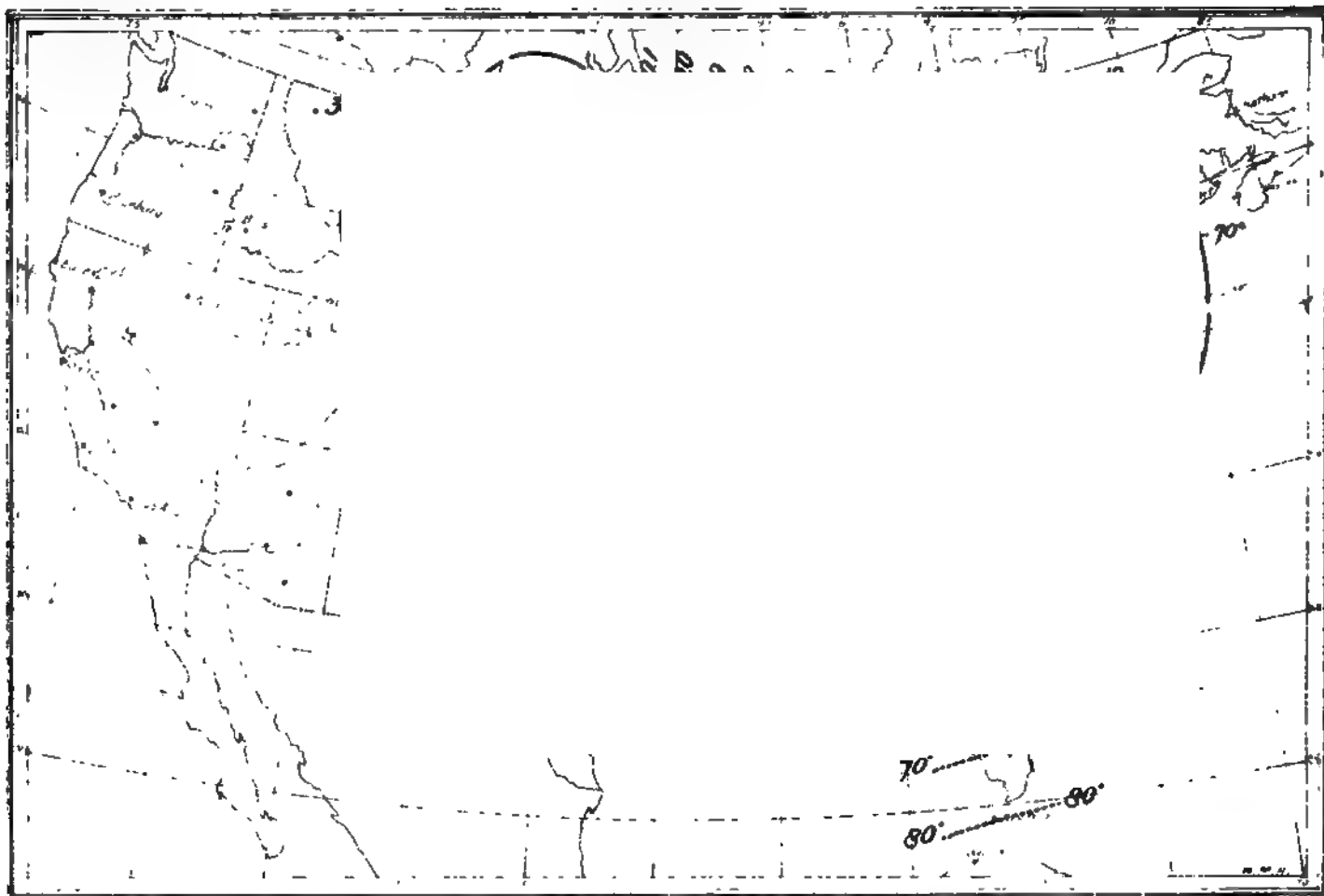
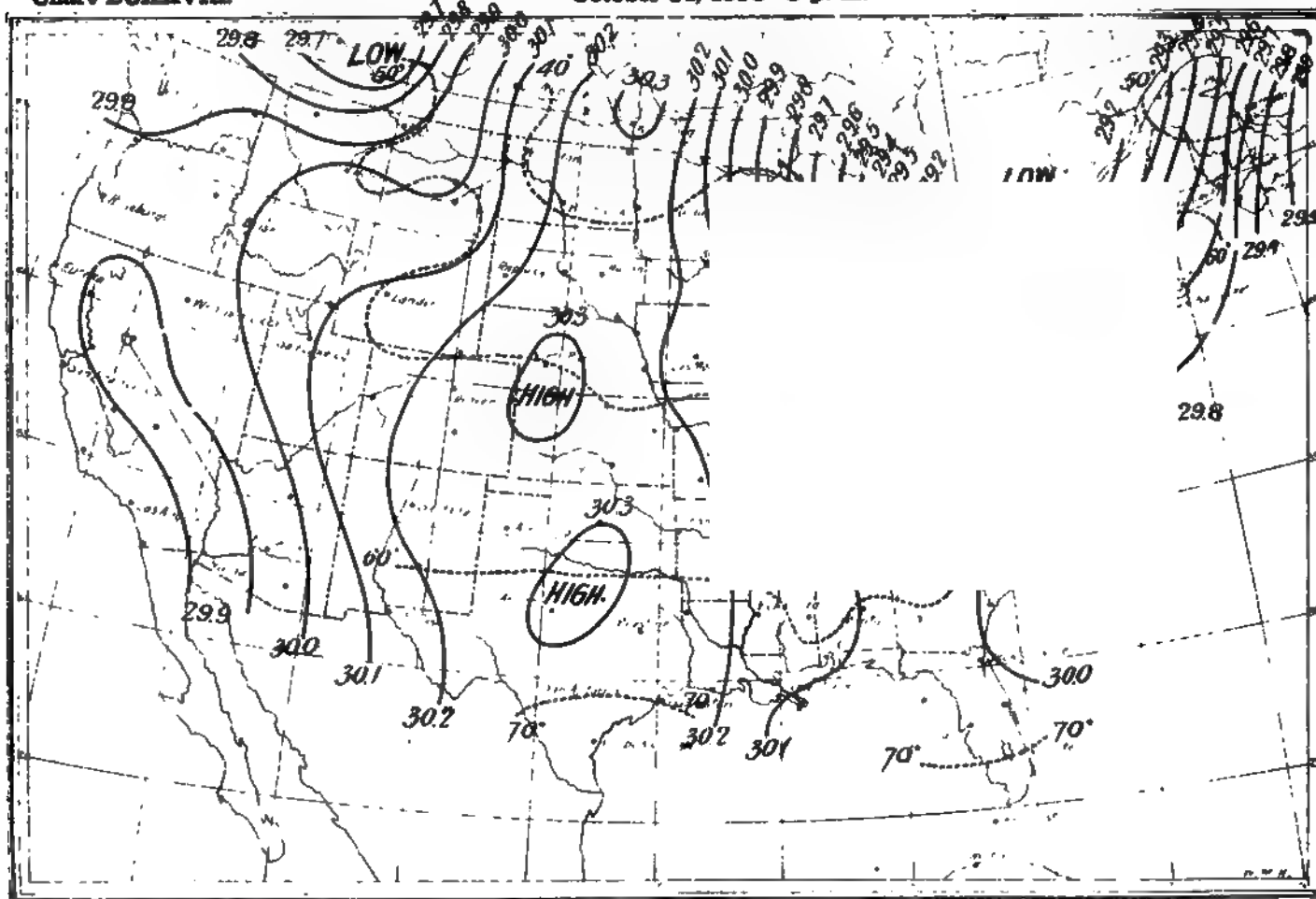


Chart DOXXVIII.

October 14, 1898—8 p. m.



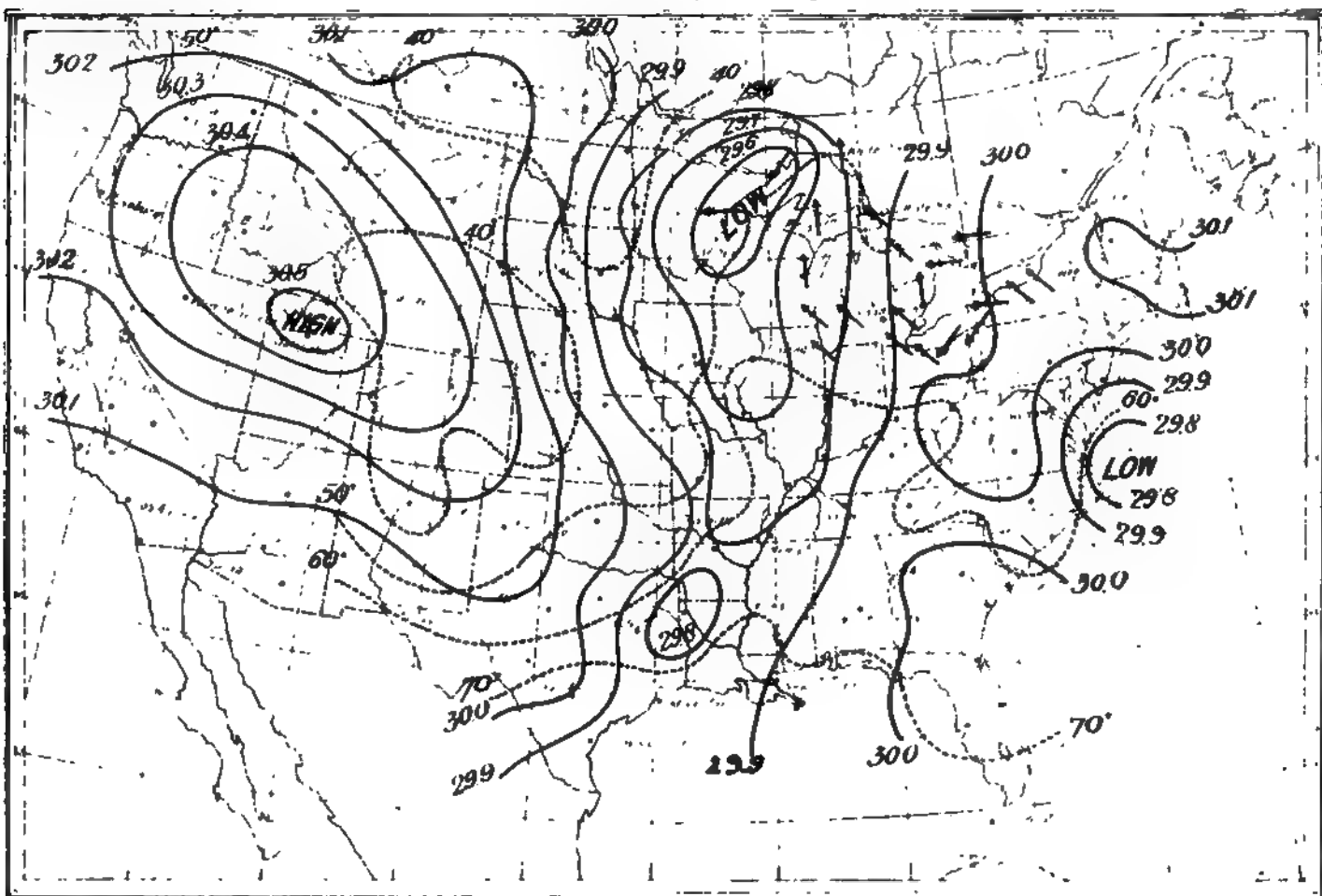
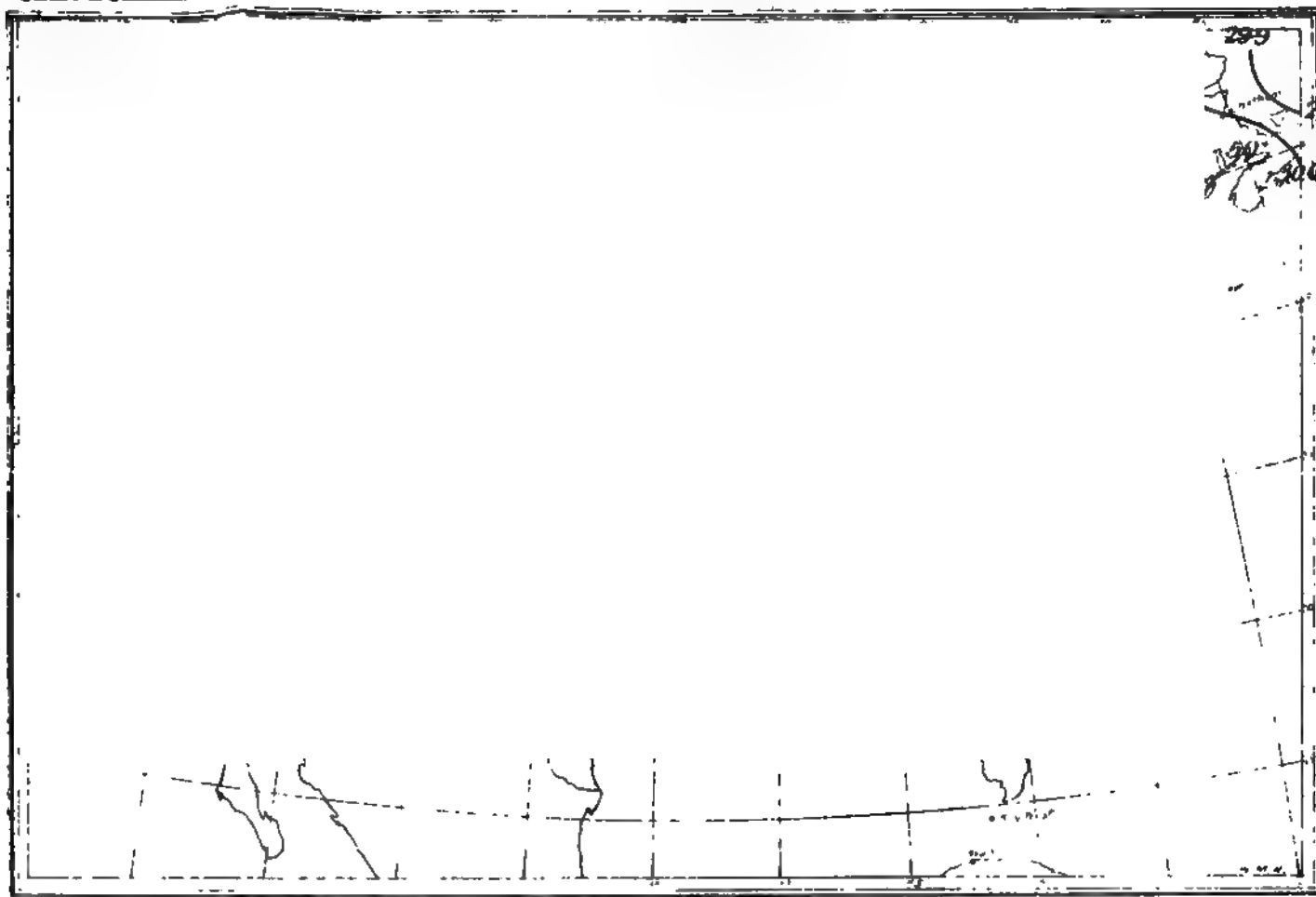


Chart DXXXXI.

October 29, 1894—8 a. m.

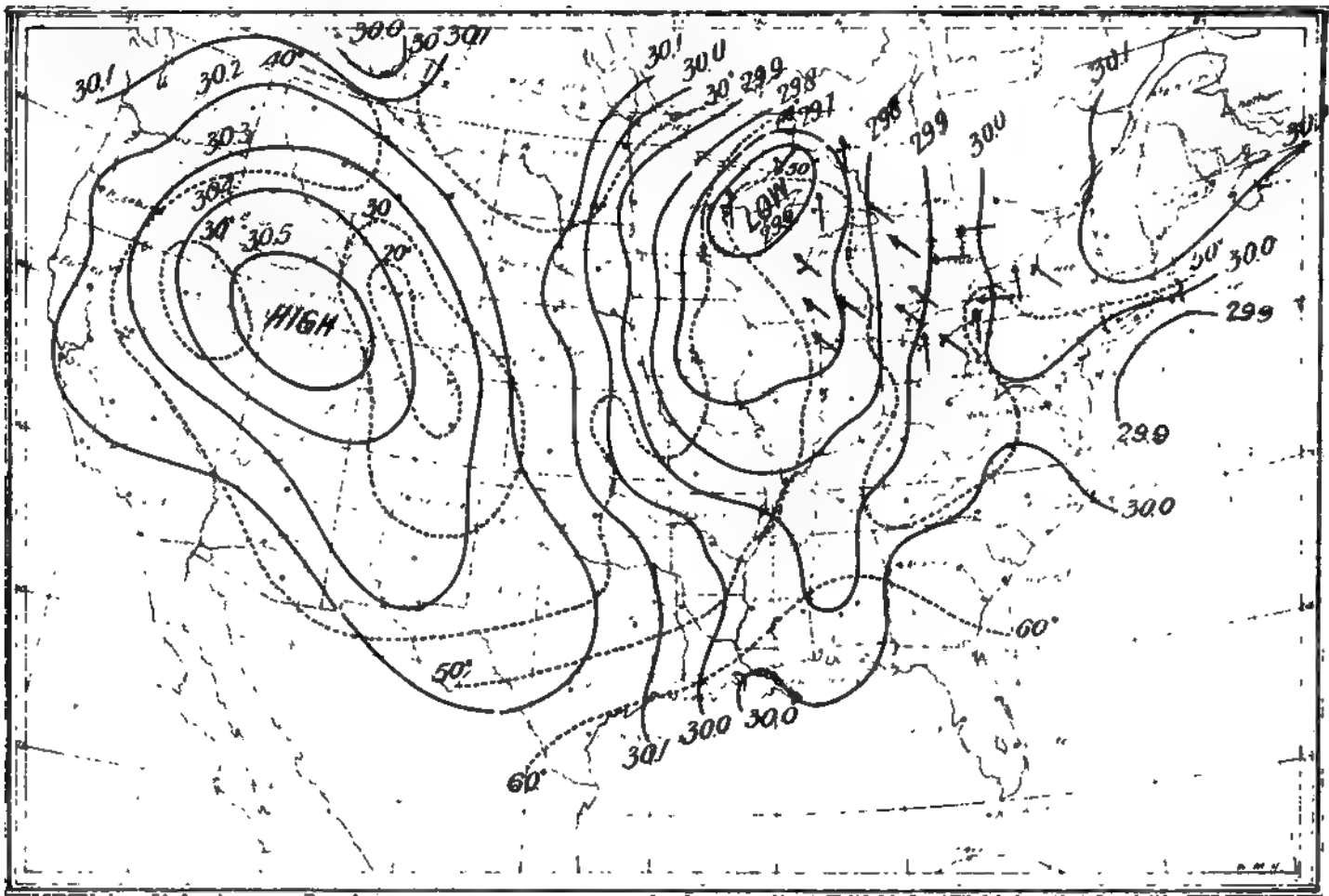


Chart DXXXXII.

October 29, 1894—8 p. m.

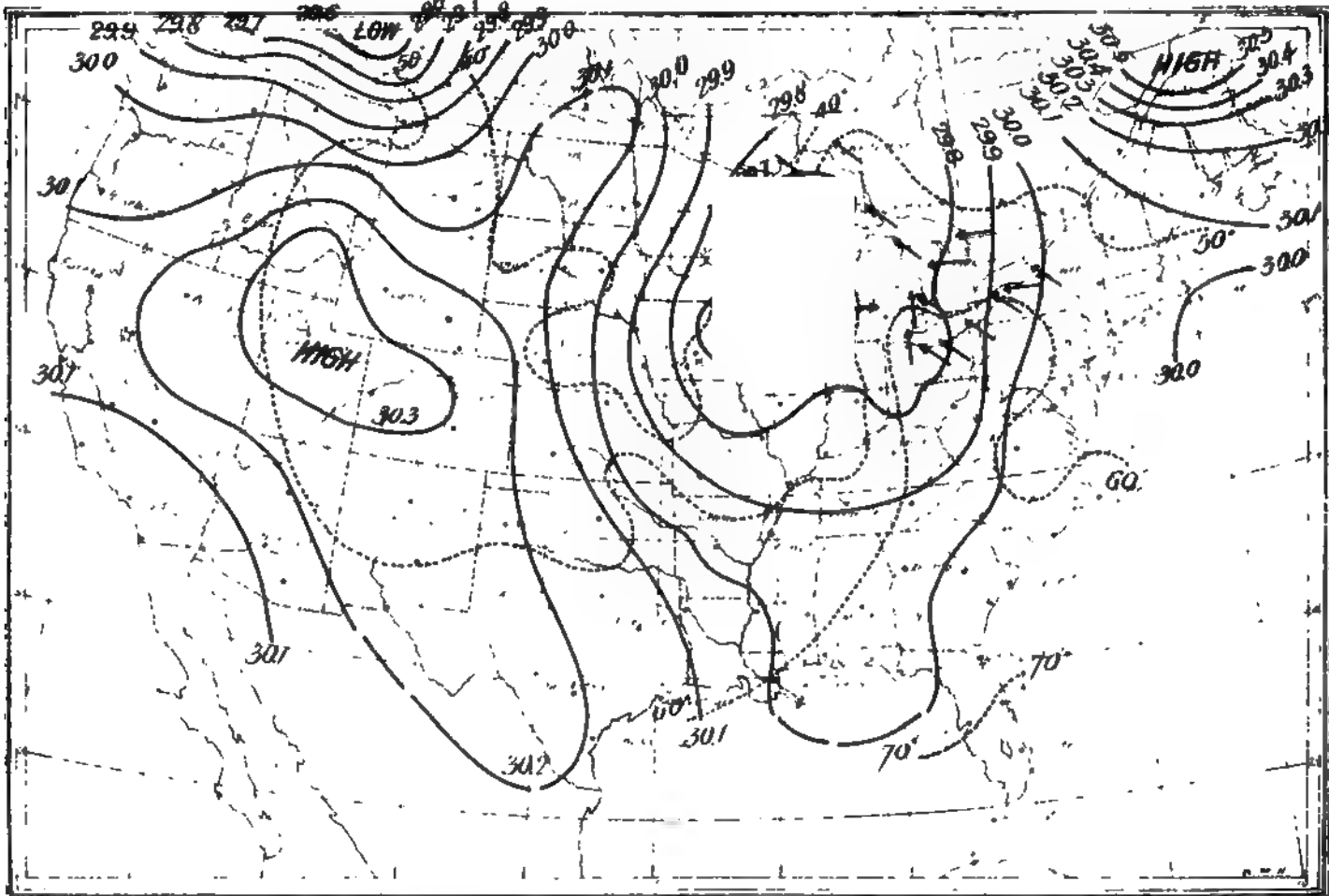


Chart DCXXXIII.

October 30, 1894—8 a. m.

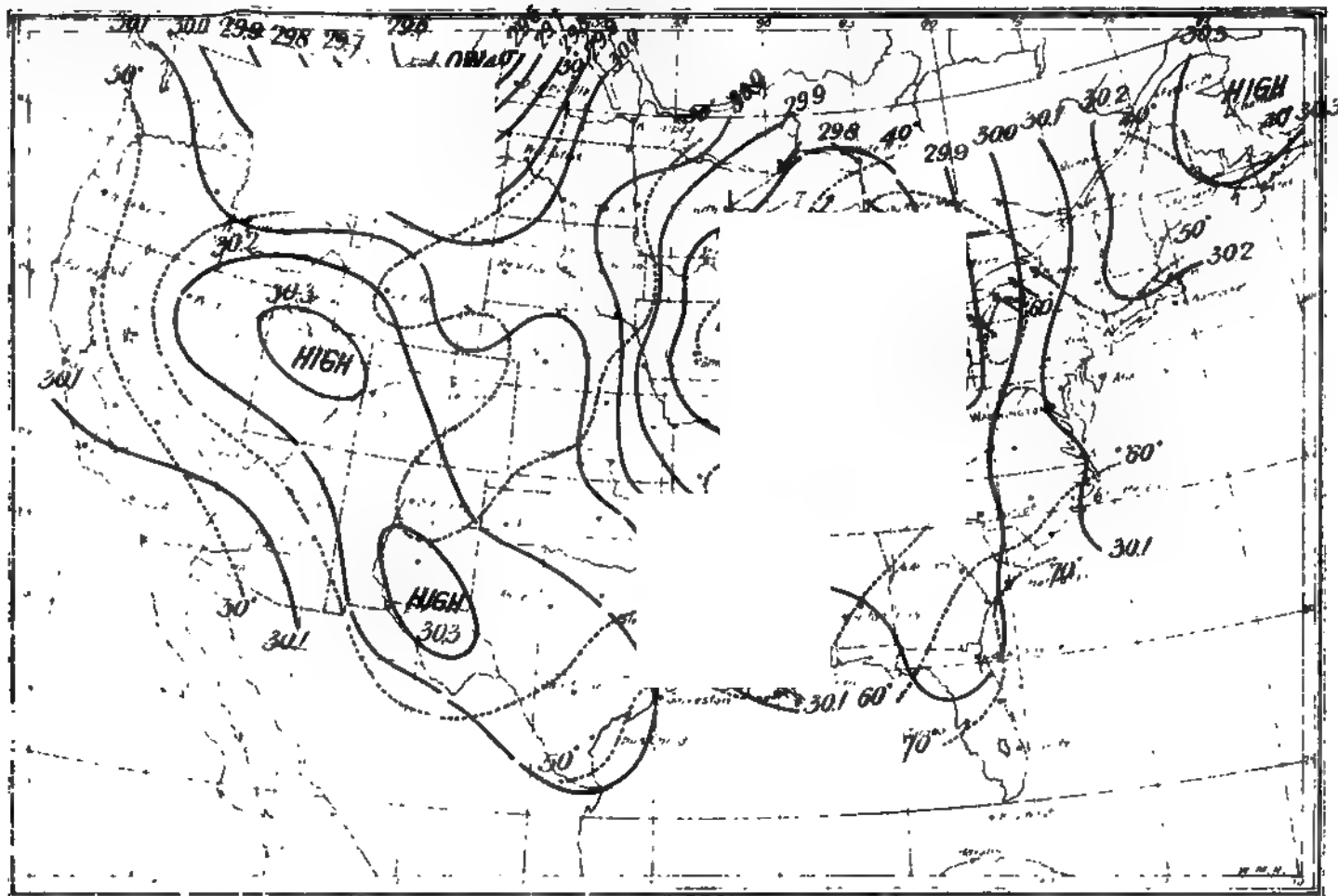


Chart DCXXXIV.

October 30, 1894—8 p. m.

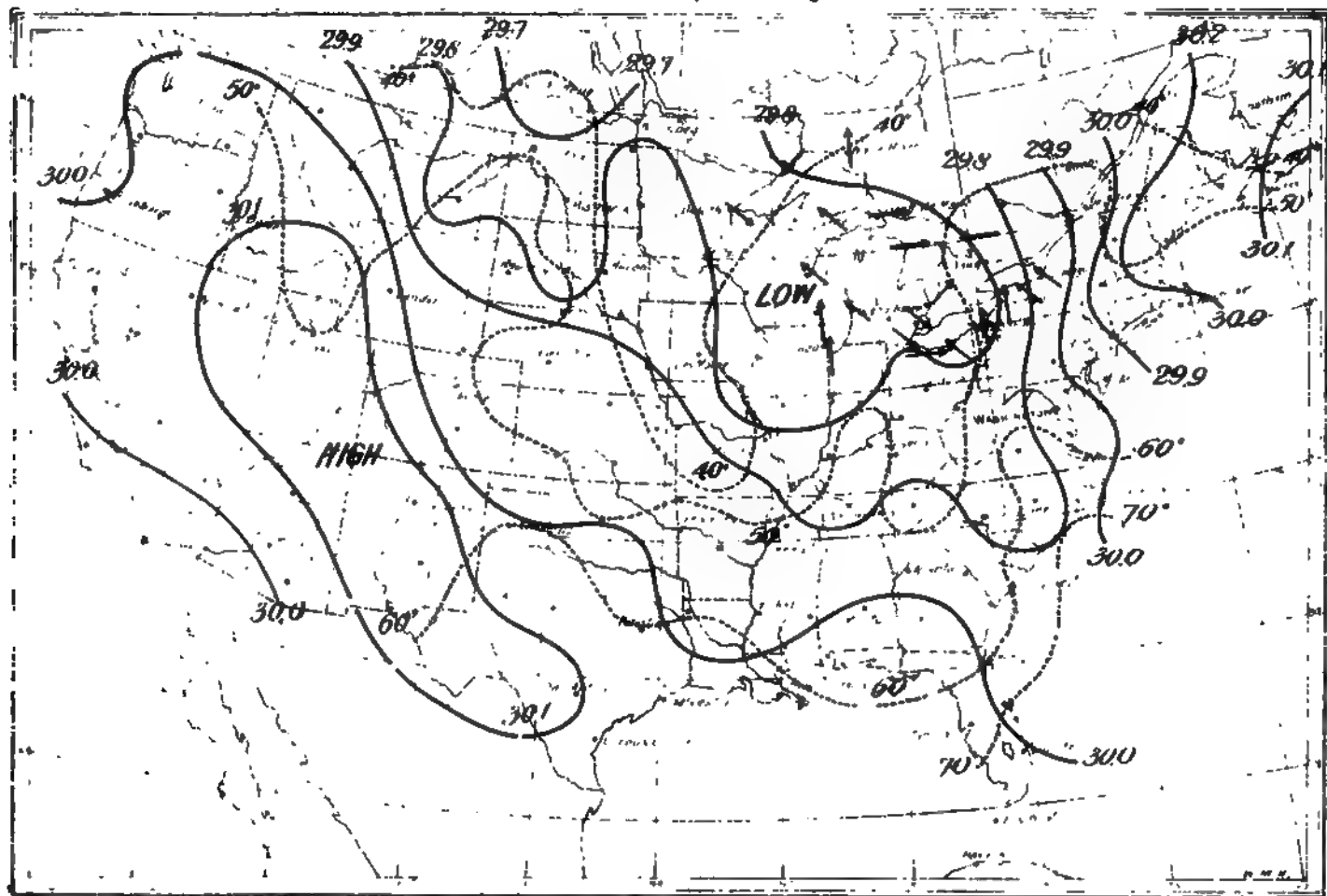


Chart DOXIX.

October 31, 1891—8 a. m.

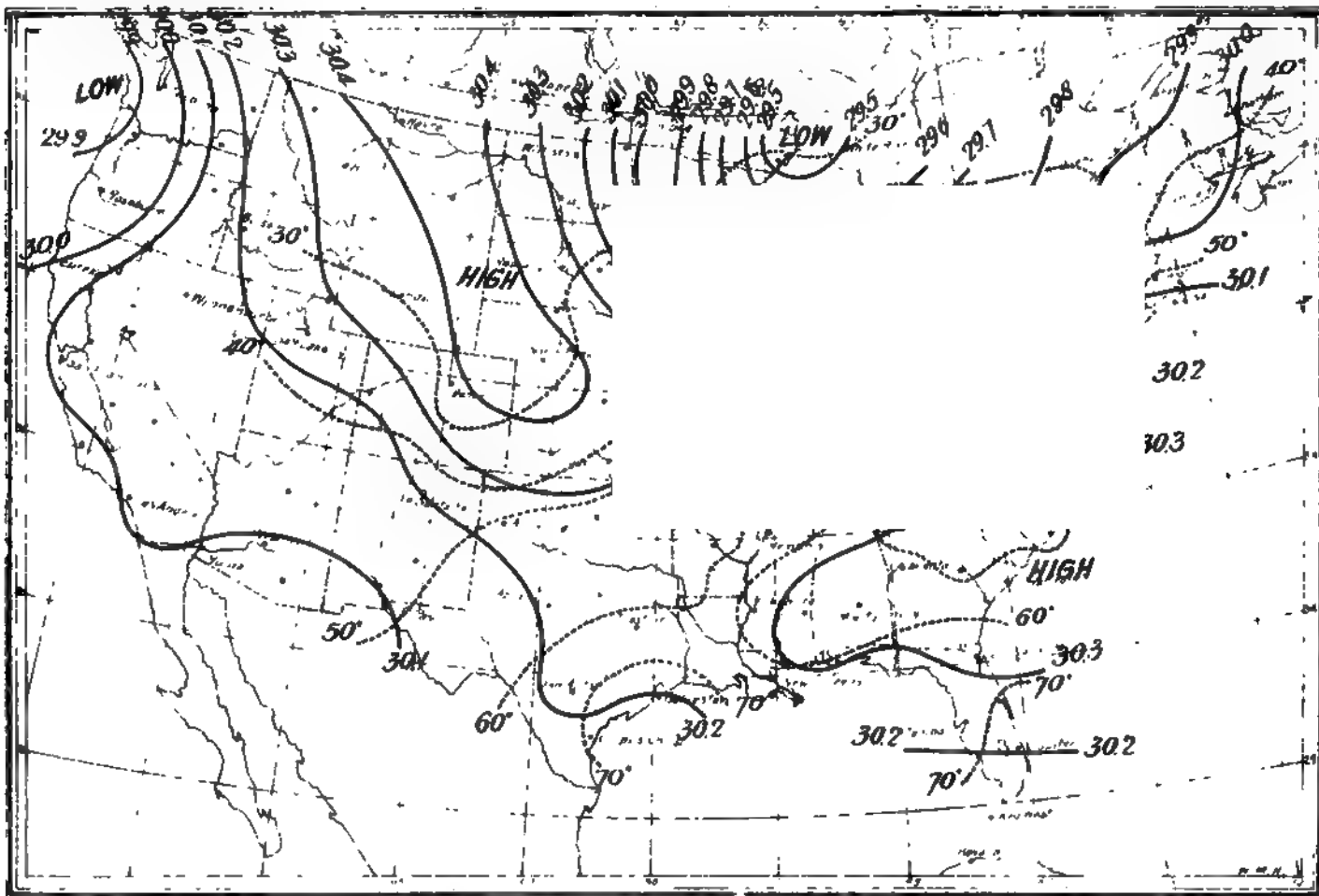


Chart DOXX.

October 31, 1891—8 p. m.

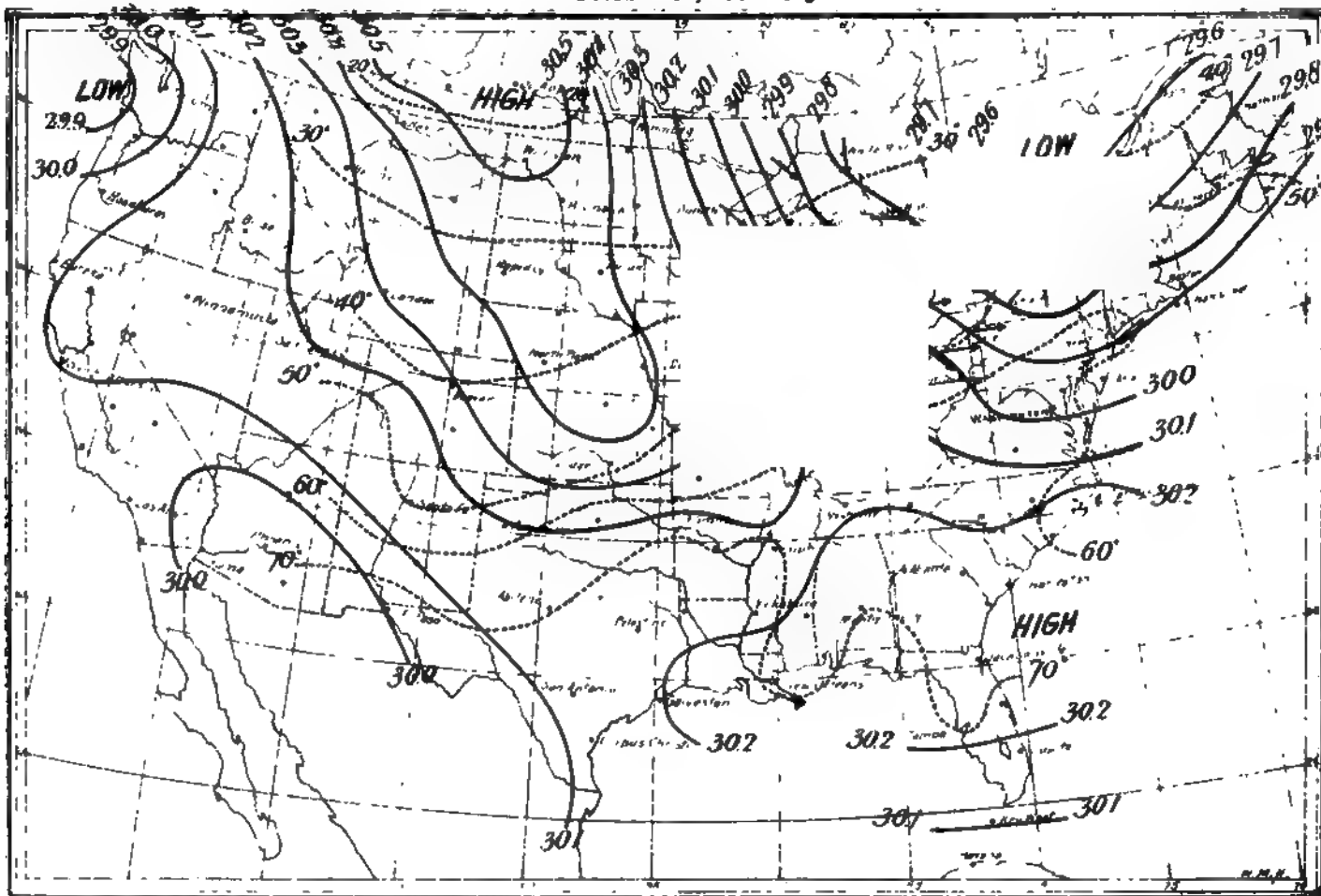


Chart DOXXI.

October 27, 1892—8 p. m.

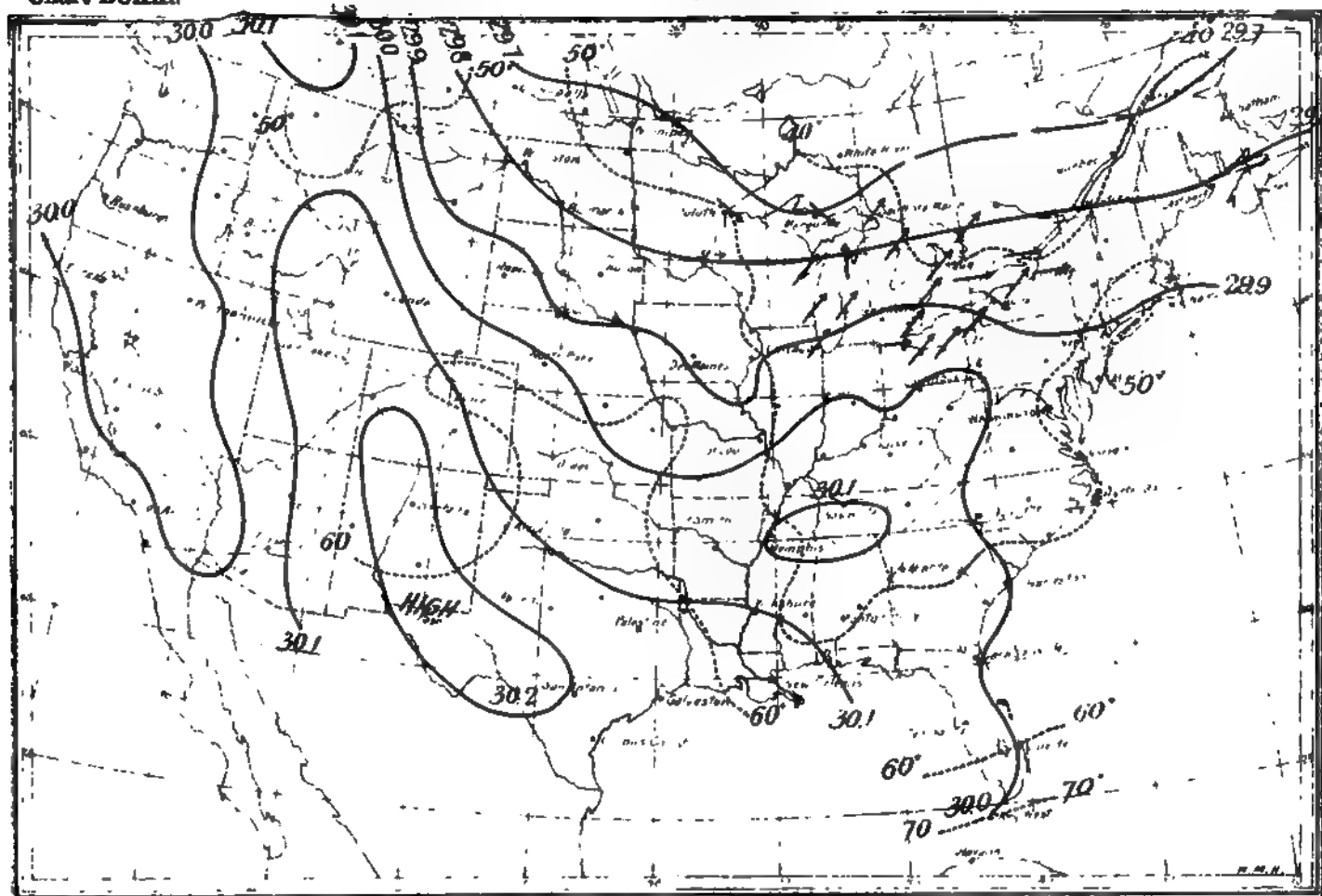


Chart DOXXII.

October 28, 1892—8 a. m.

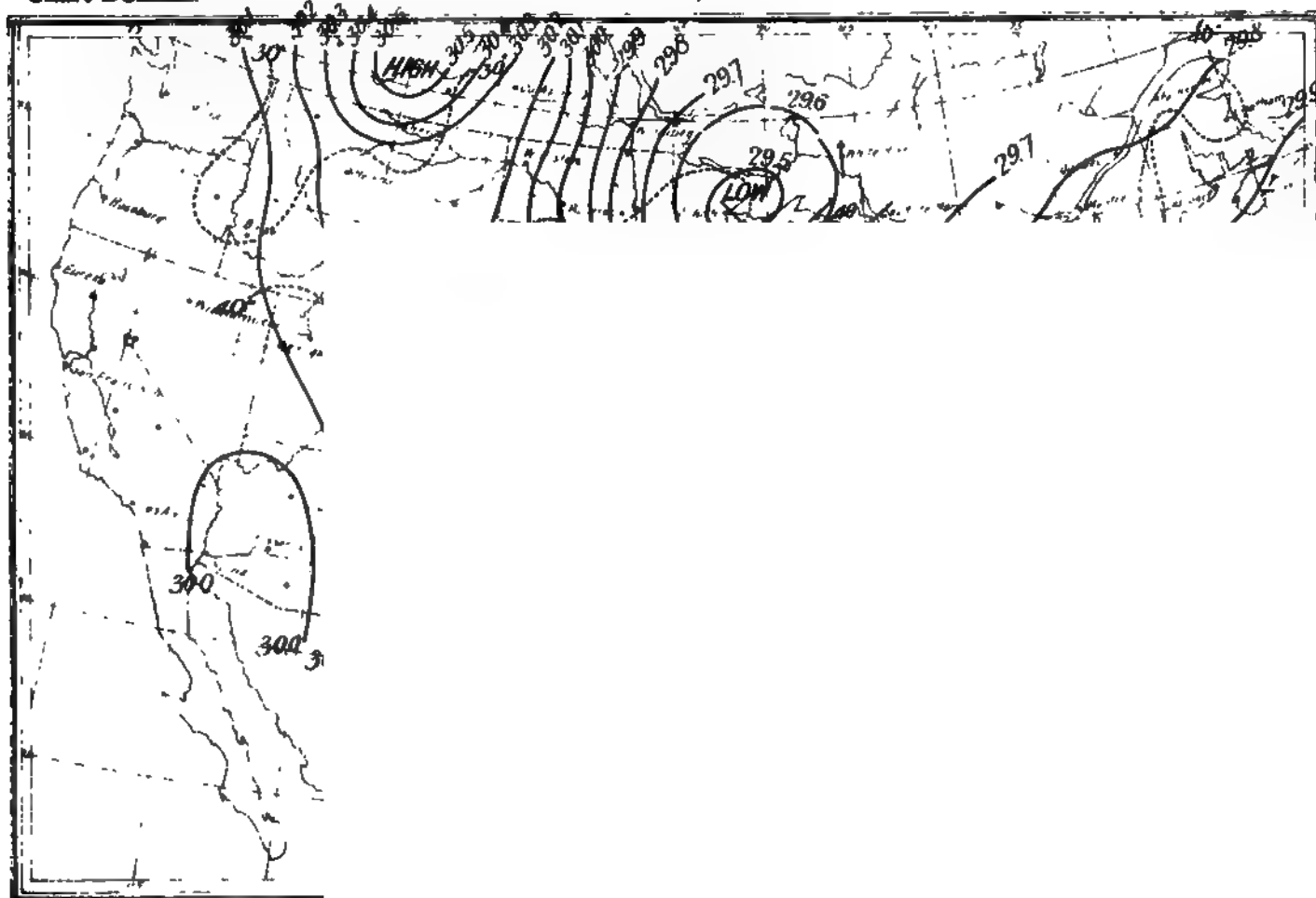


Chart DOXXIII.

October 28, 1892—8 p. m.

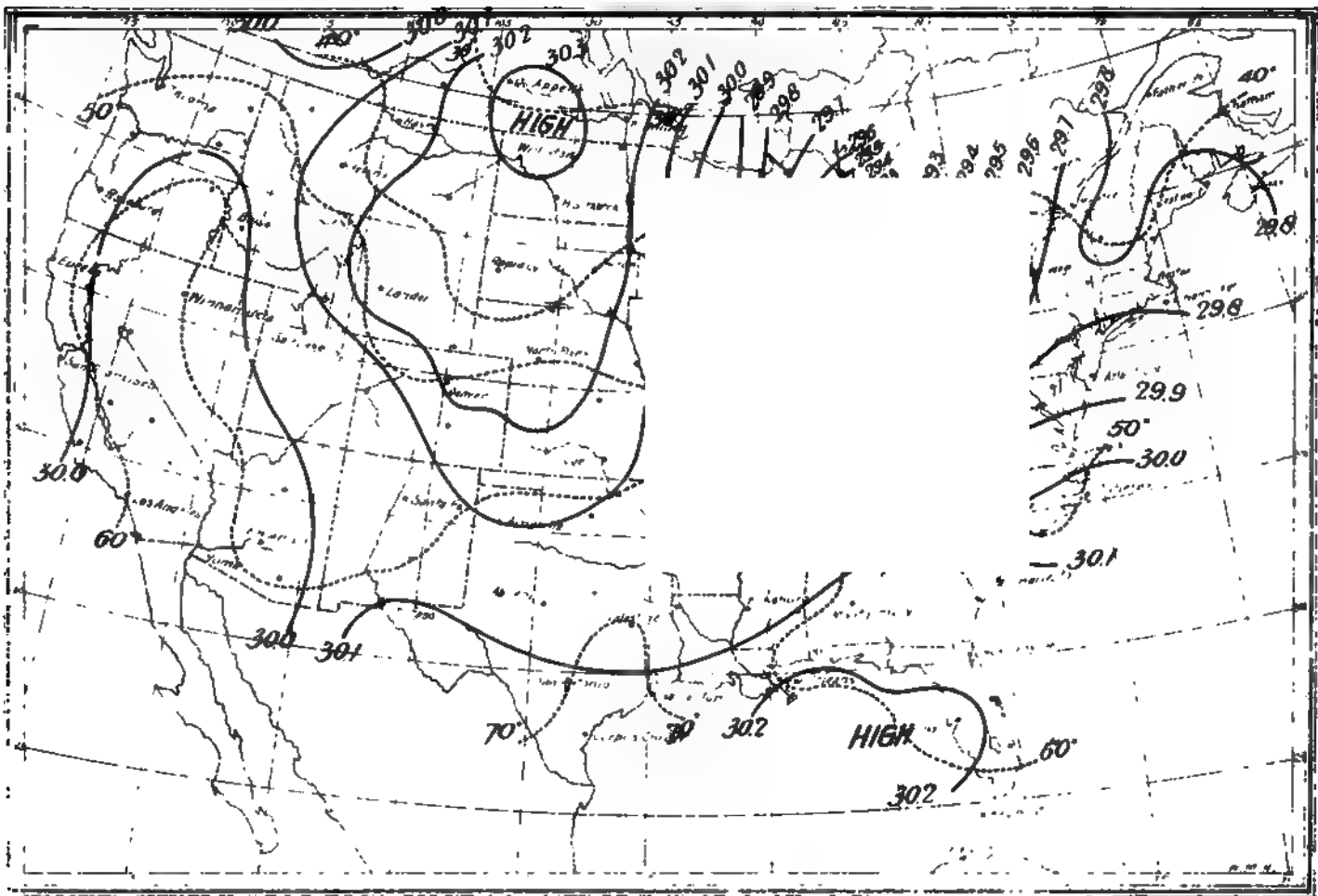


Chart DOXXIV.

October 29, 1892—8 a. m.

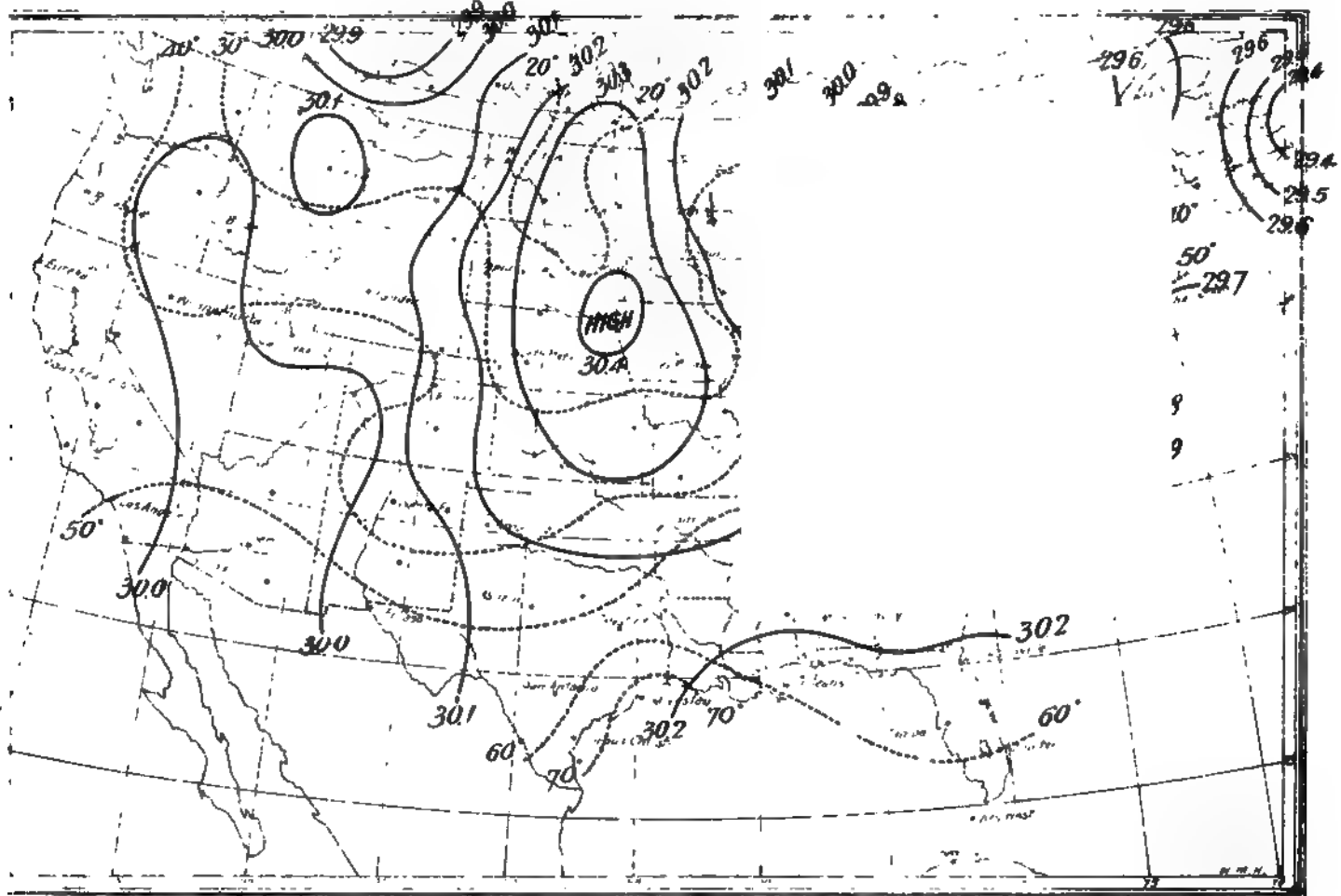


Chart DXXXIV.

October 18, 1898—8 a. m.



Chart DOXXVI.

October 18, 1893—8 p. m.

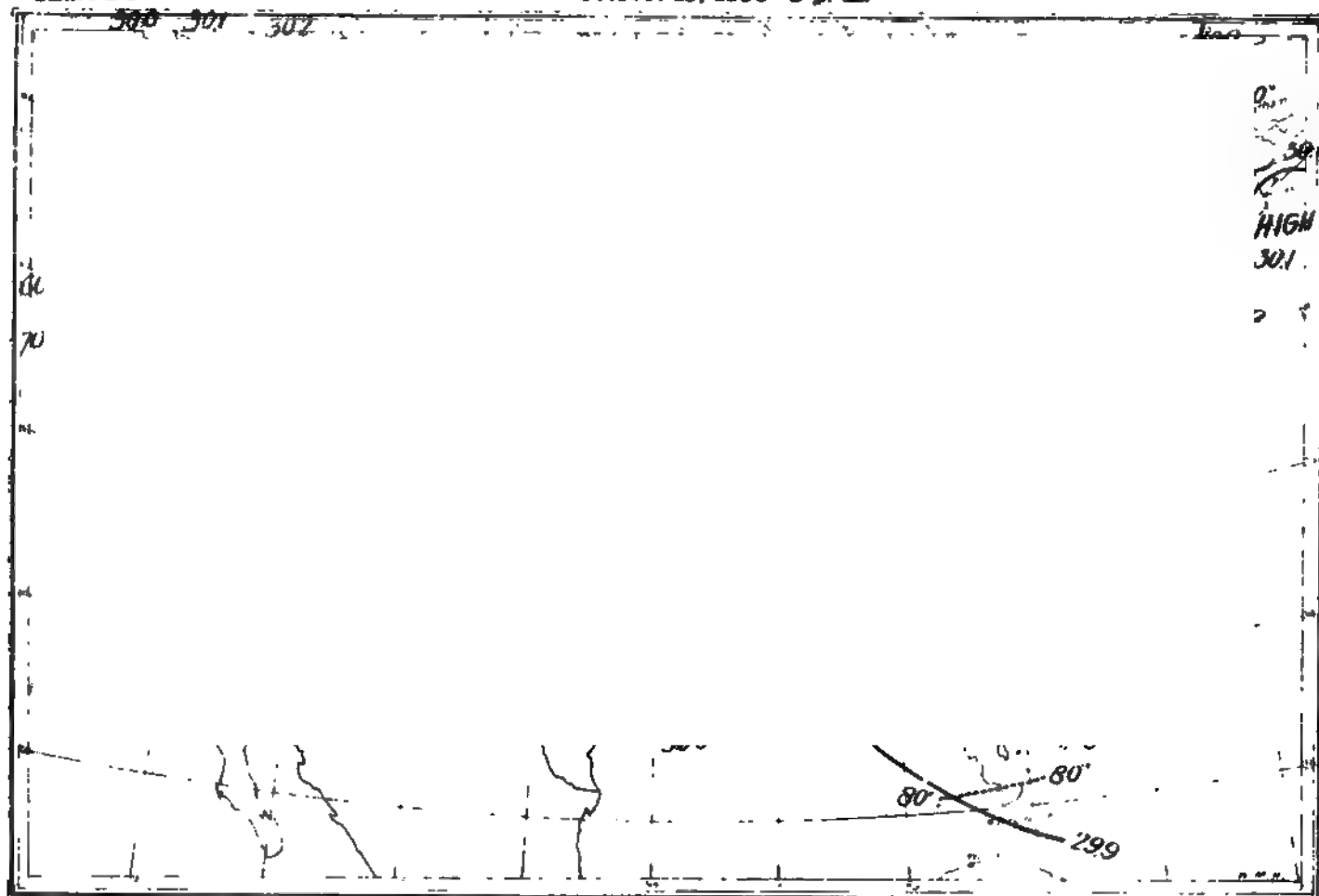


Chart DOXXVII.

October 14, 1898—8 a. m.

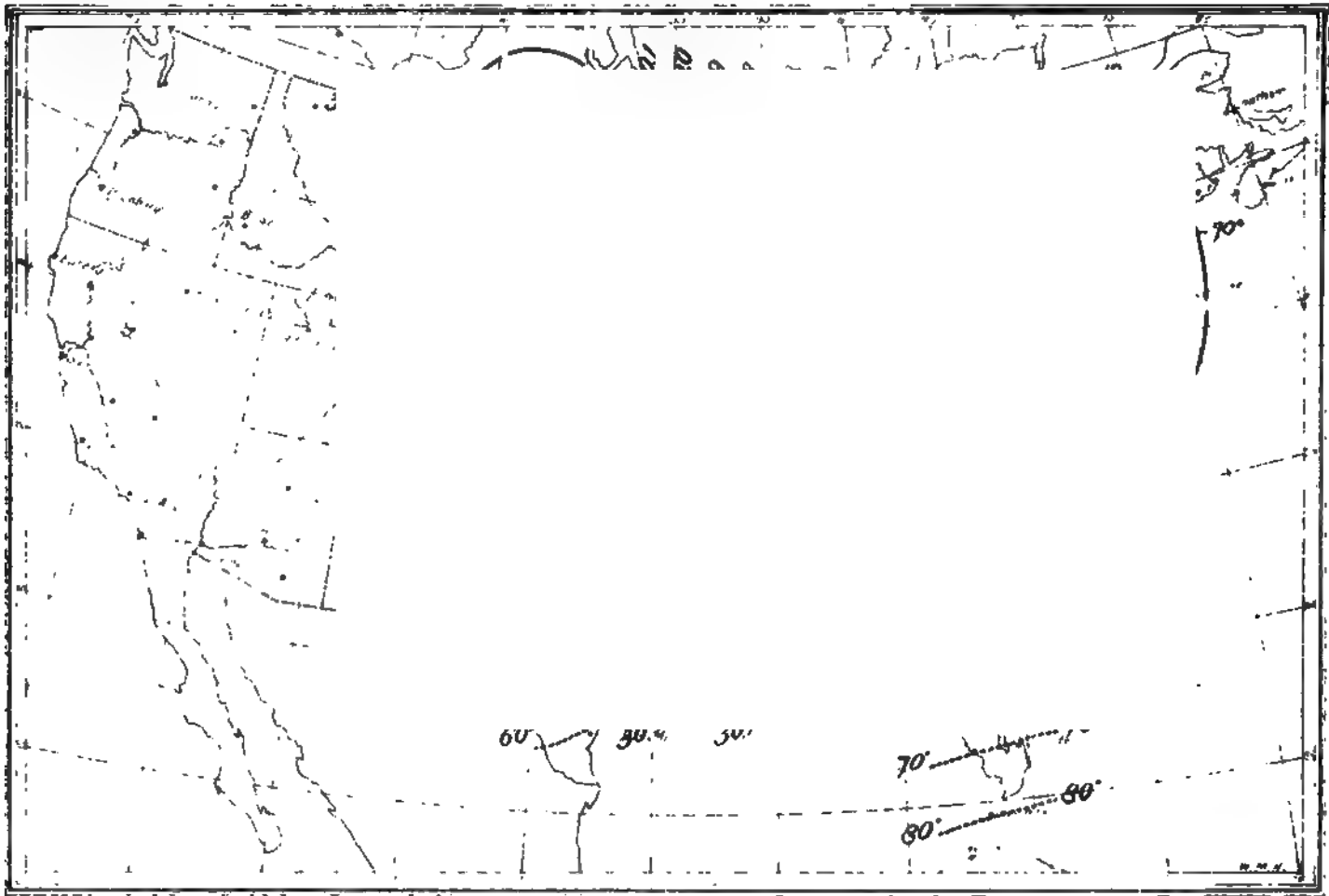


Chart DOXXVIII.

October 14, 1898—8 p. m.

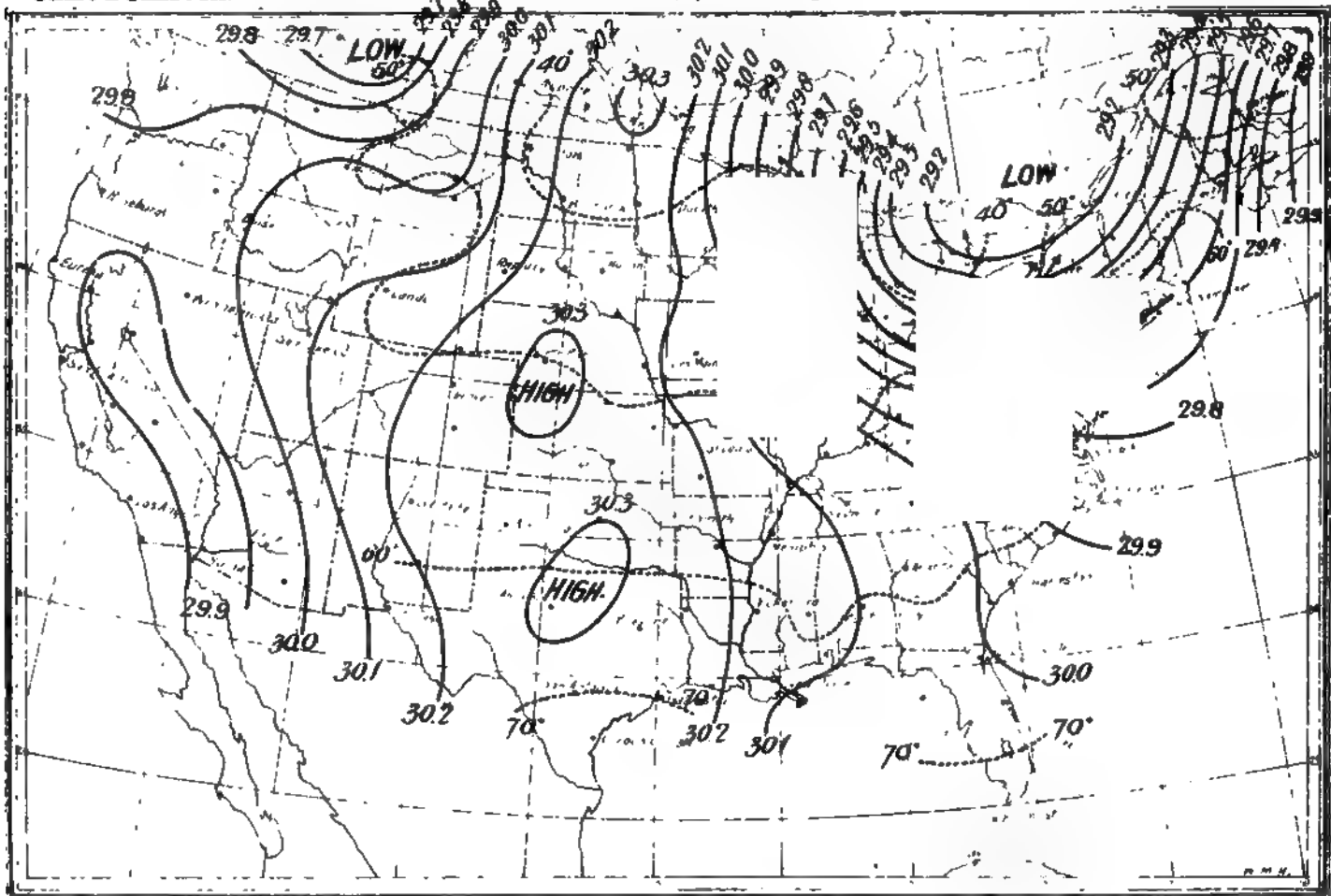
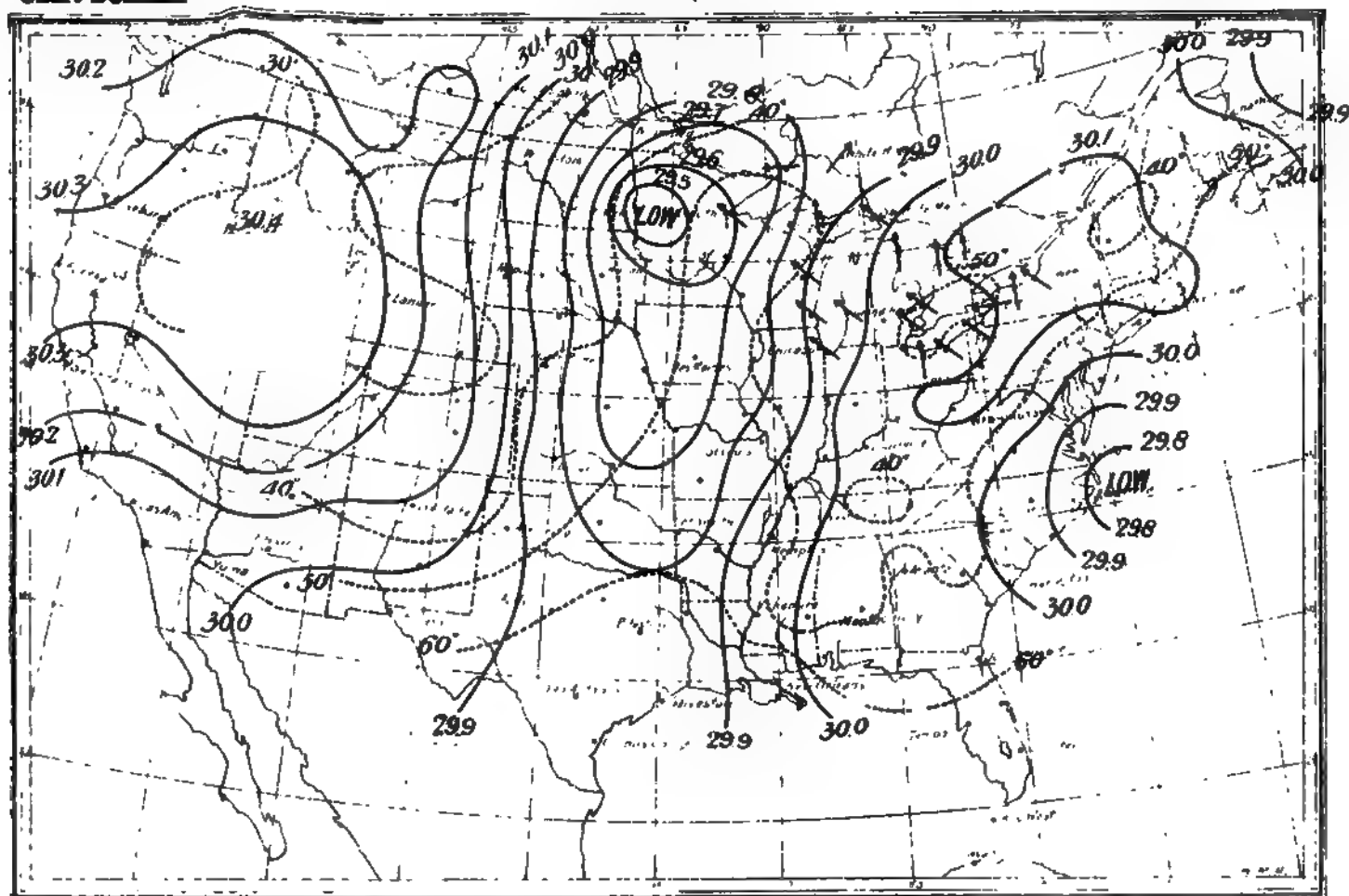
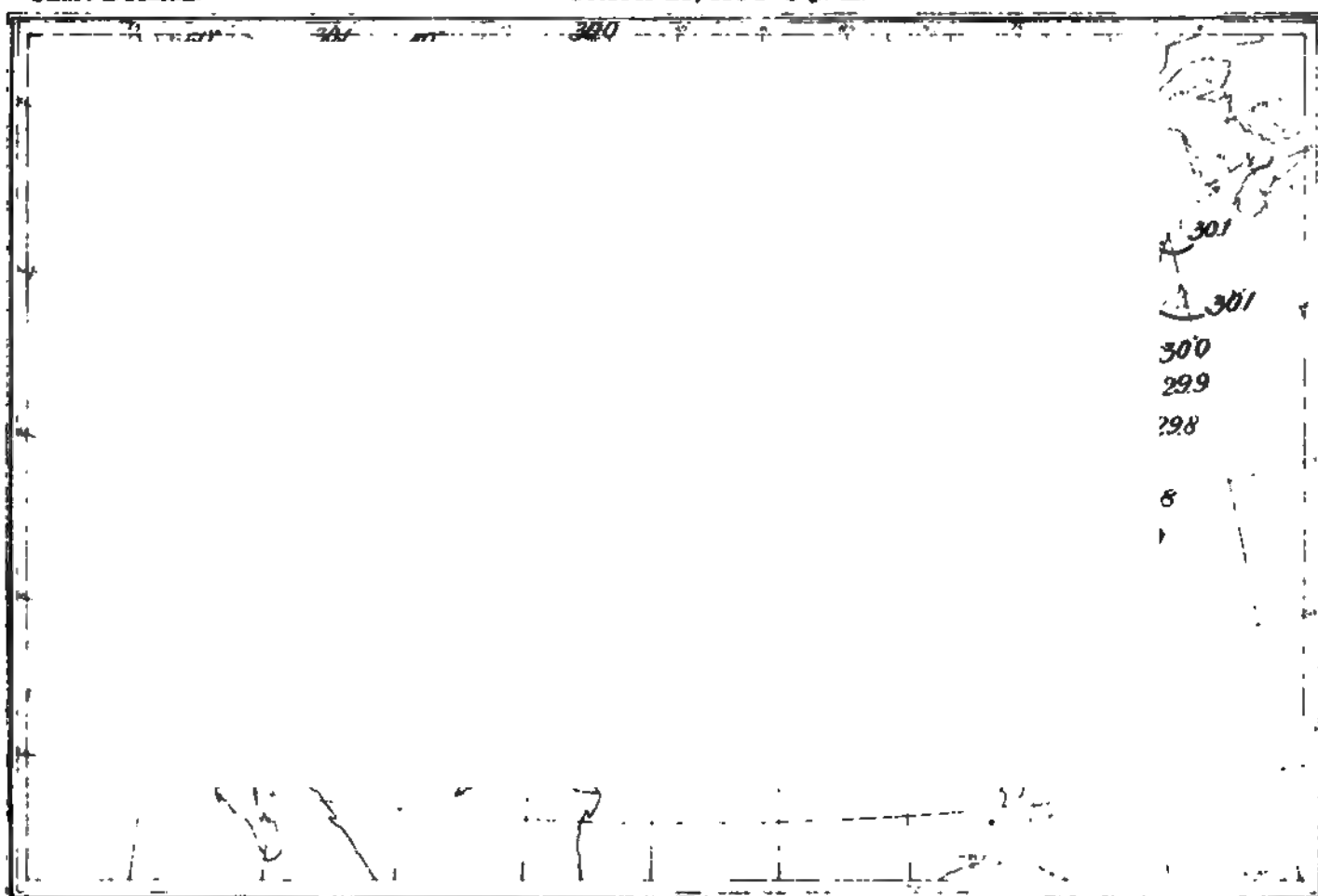


Chart DXXXIX

October 28, 1894—8 a. m.

**Chart DOXXX**

October 28, 1894—8 p. m.



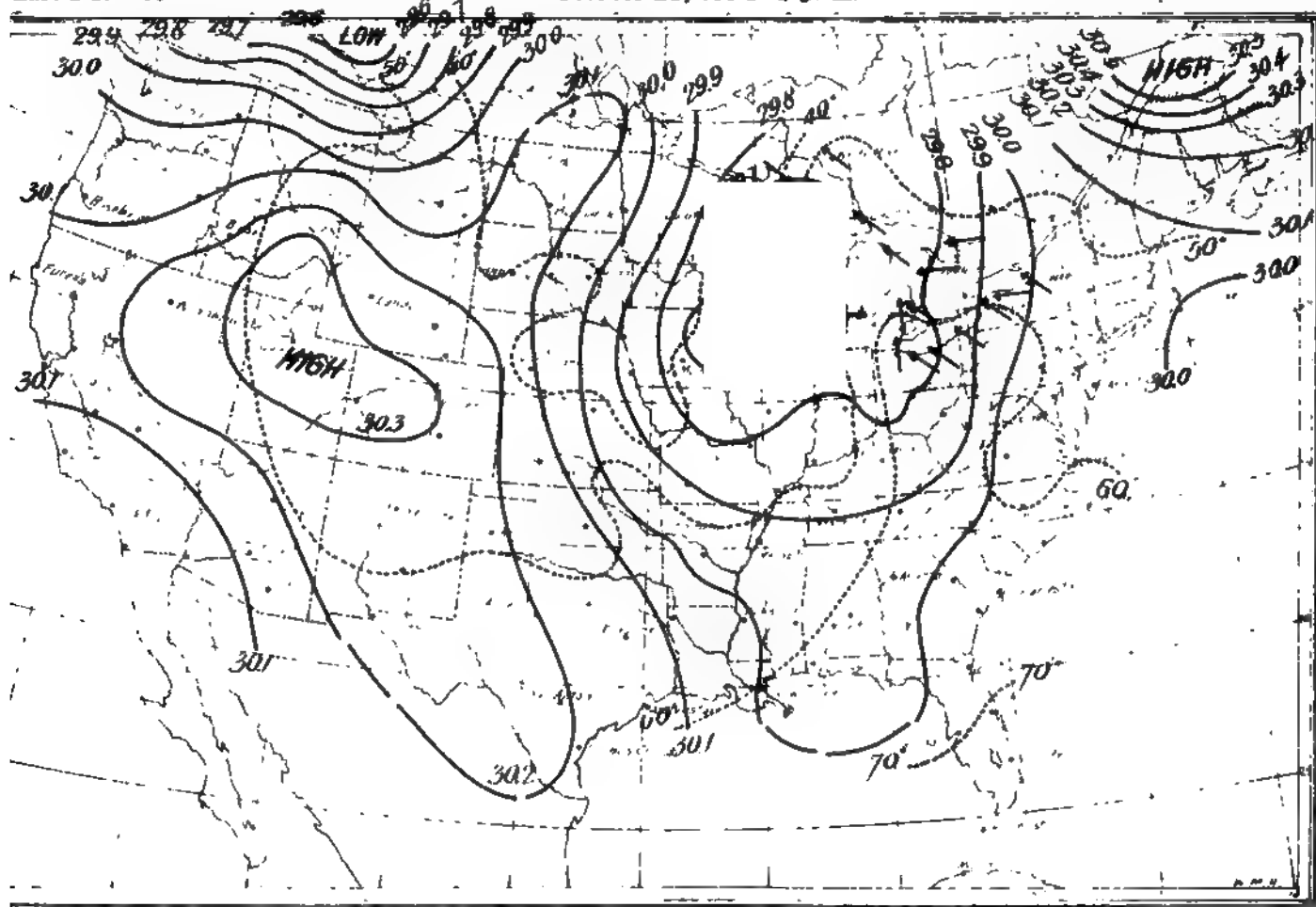
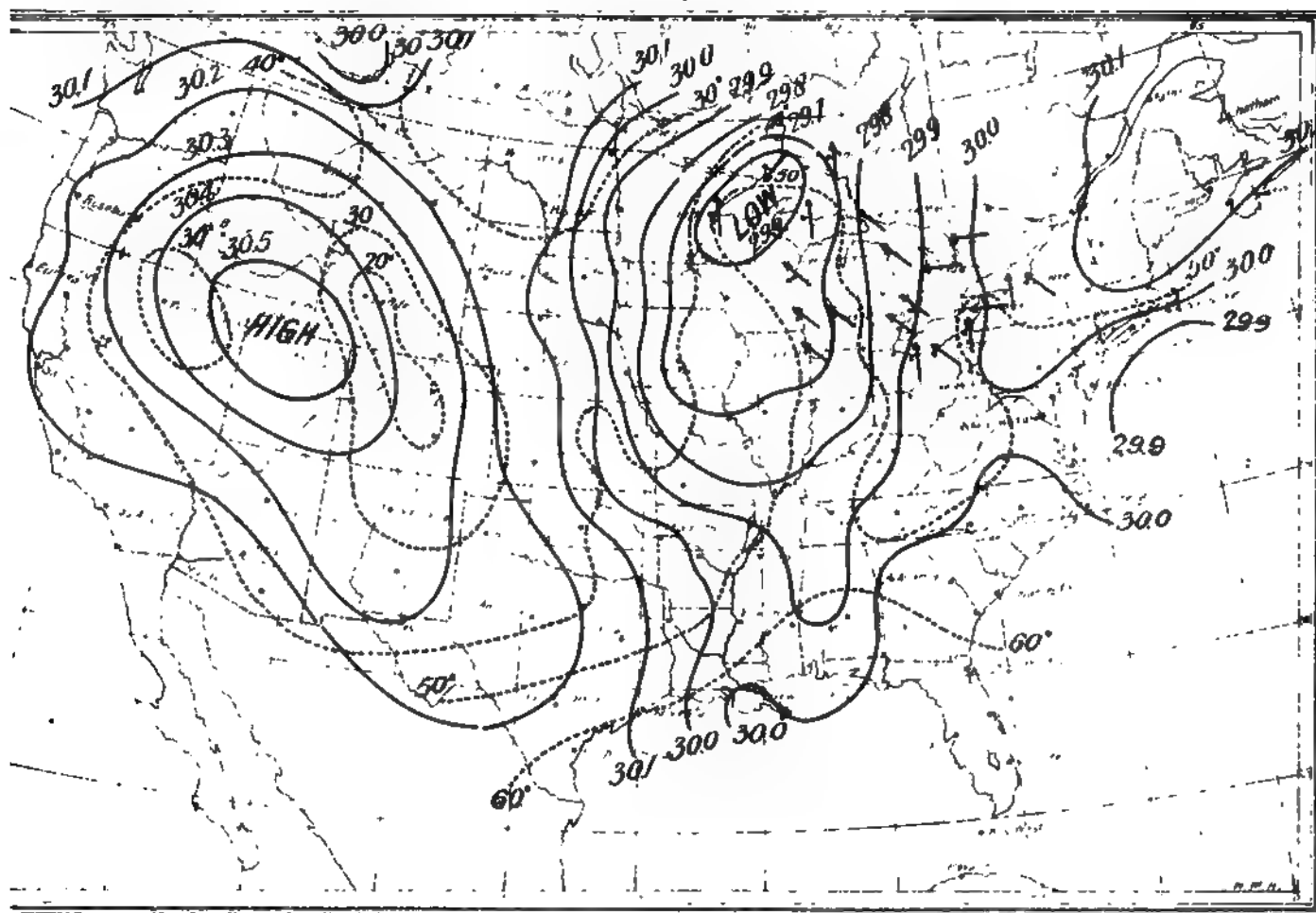


Chart DOXXXIII.

October 30, 1894—8 a. m.

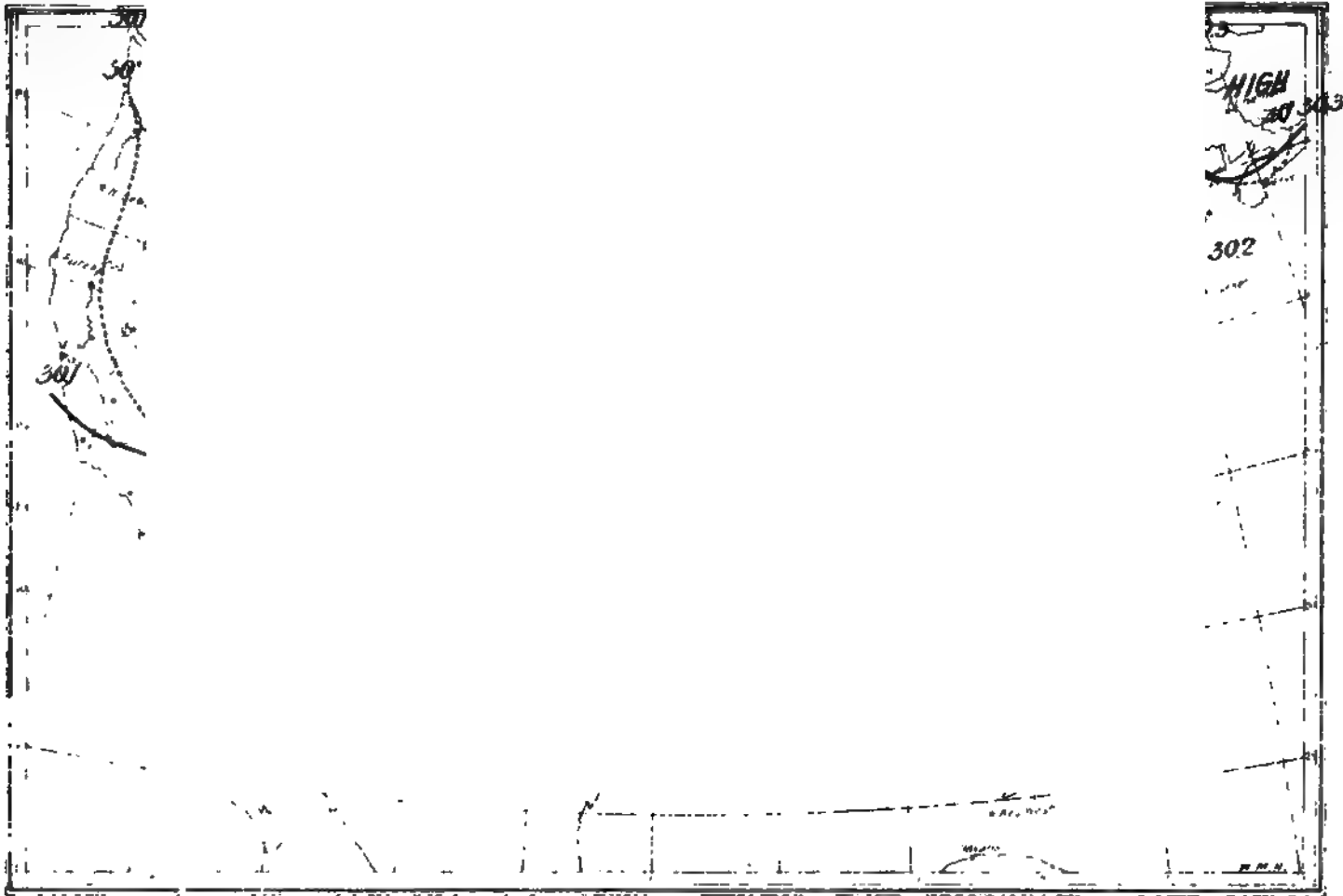


Chart DOXXXIV.

October 30, 1894—8 p. m.

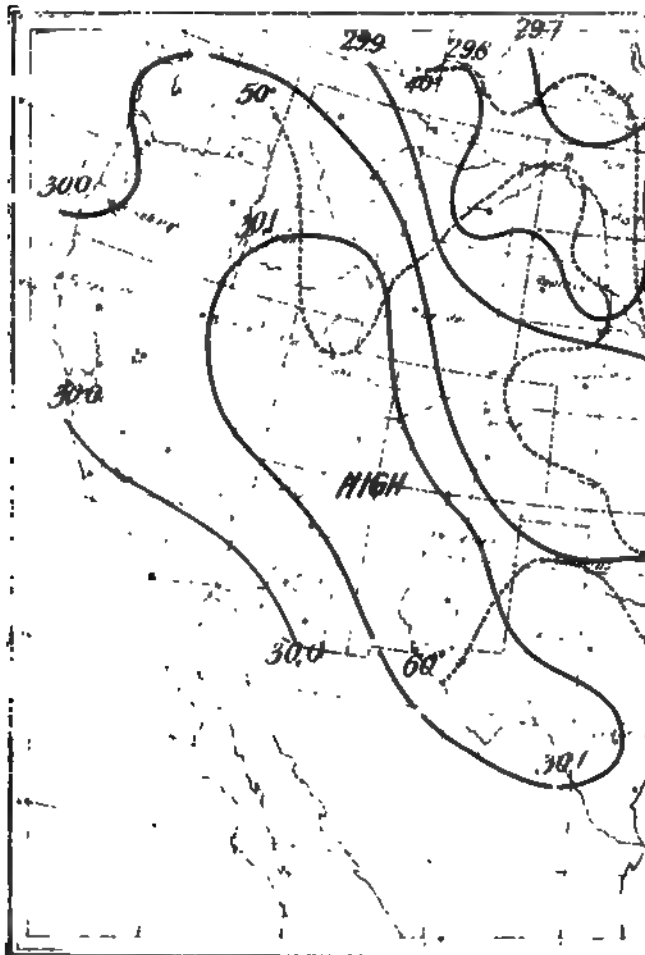


Chart DXXXXV.

October 31, 1894—8 a. m.

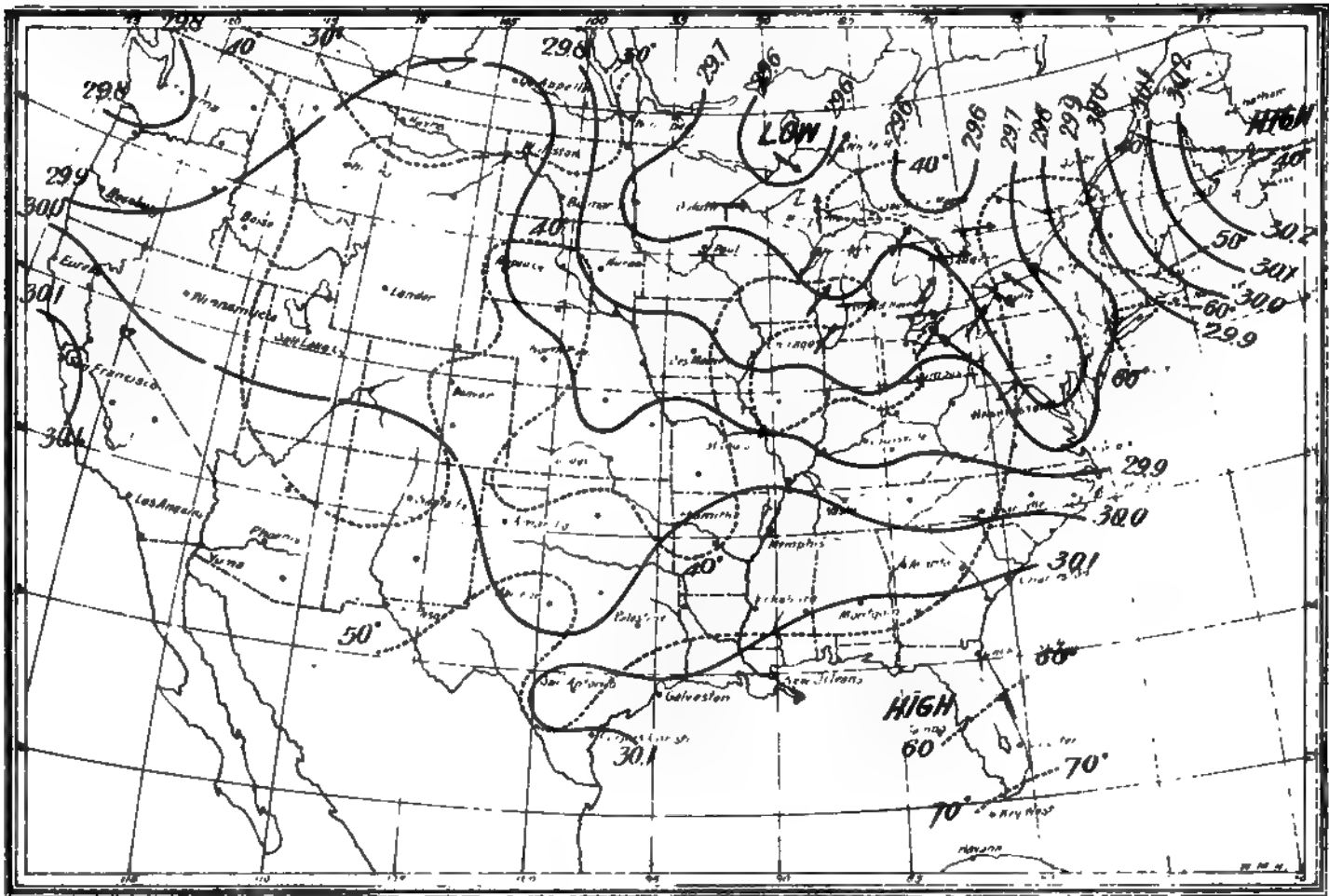


Chart DXXXXVI.

October 31, 1894—8 p. m.

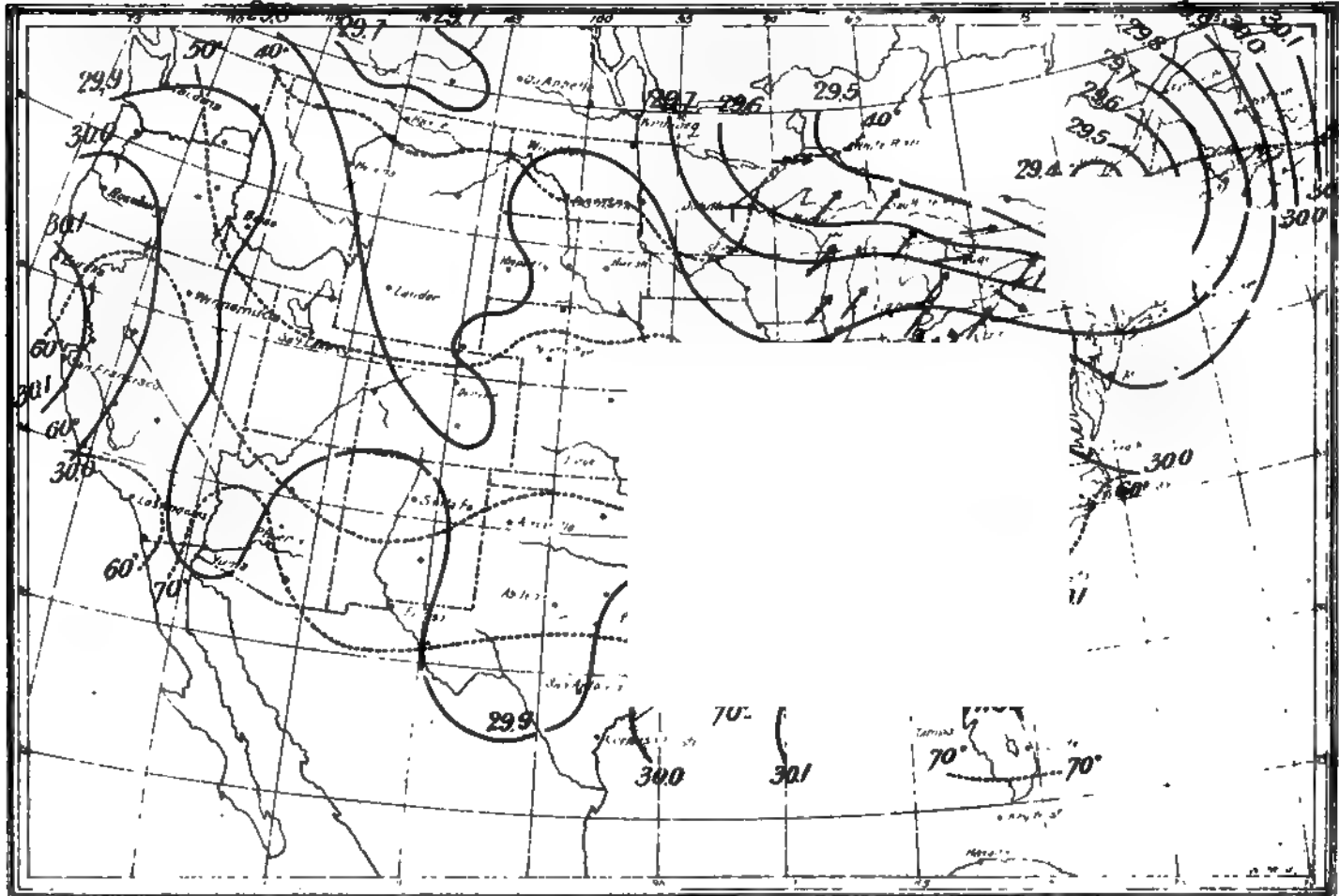


Chart DOXXXVII.

October 29, 1896—8 a. m.

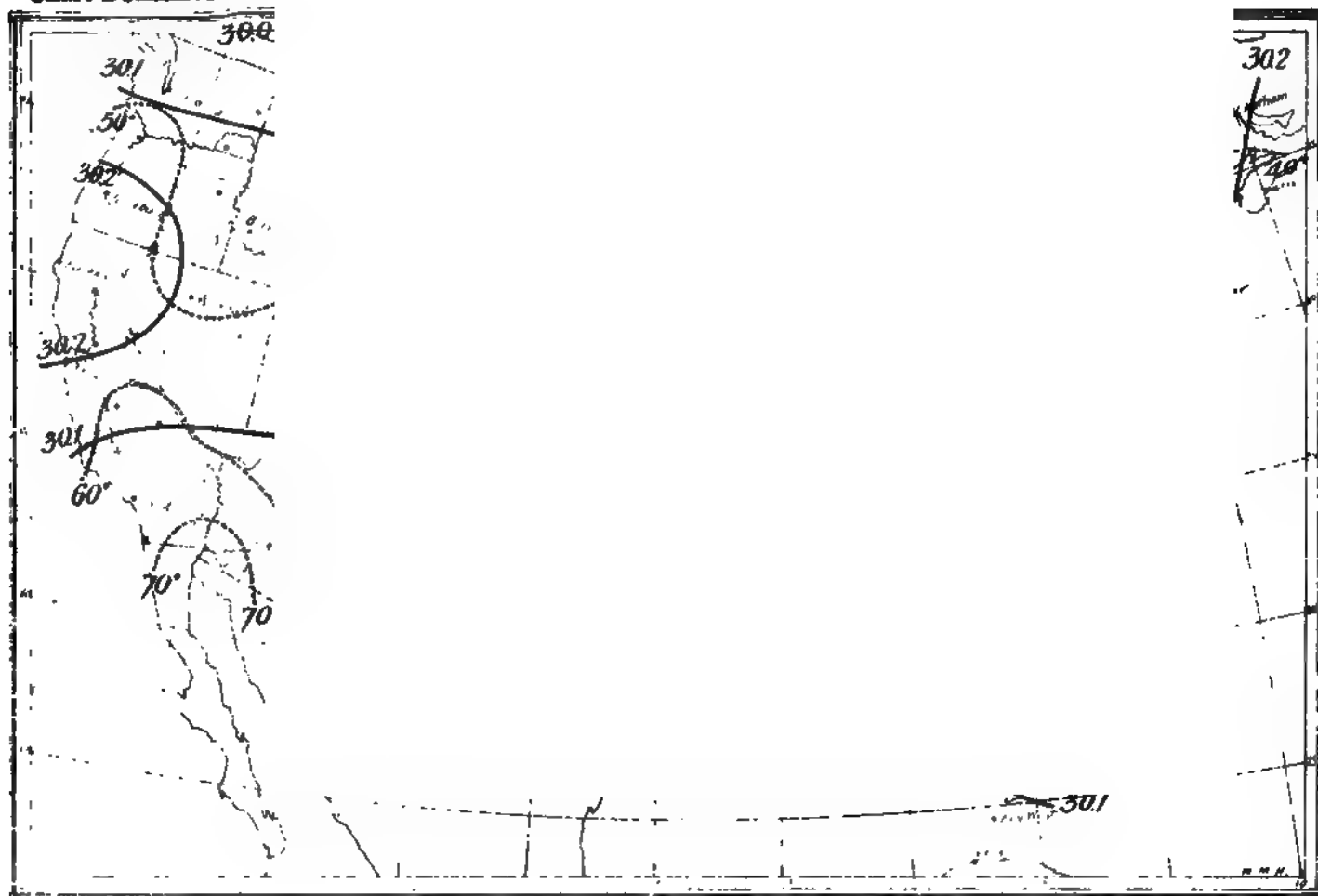


Chart DOXXXVIII.

October 30, 1896—8 a. m.

Chart DXXXXIX.

October 30, 1896—8 p. m.

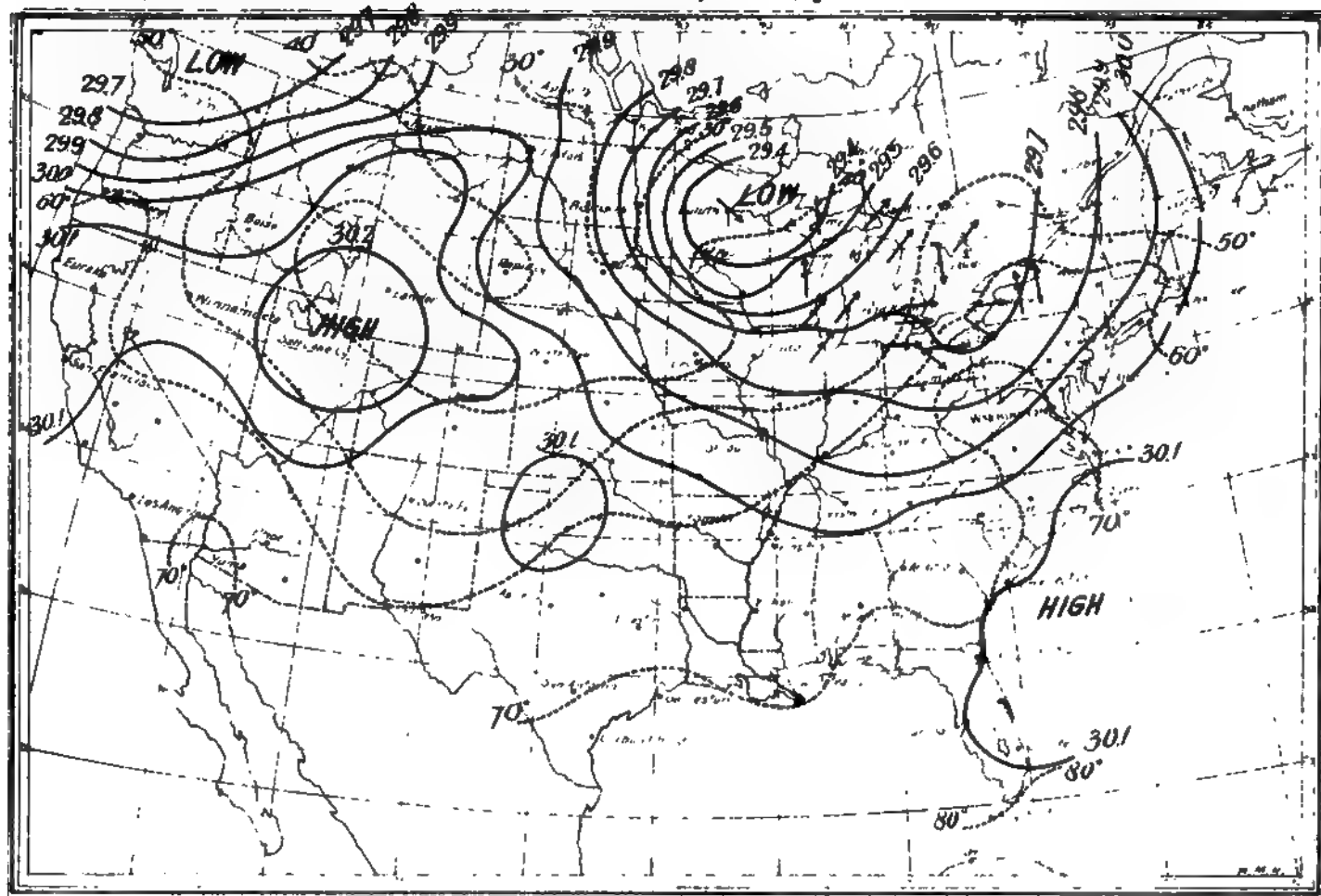
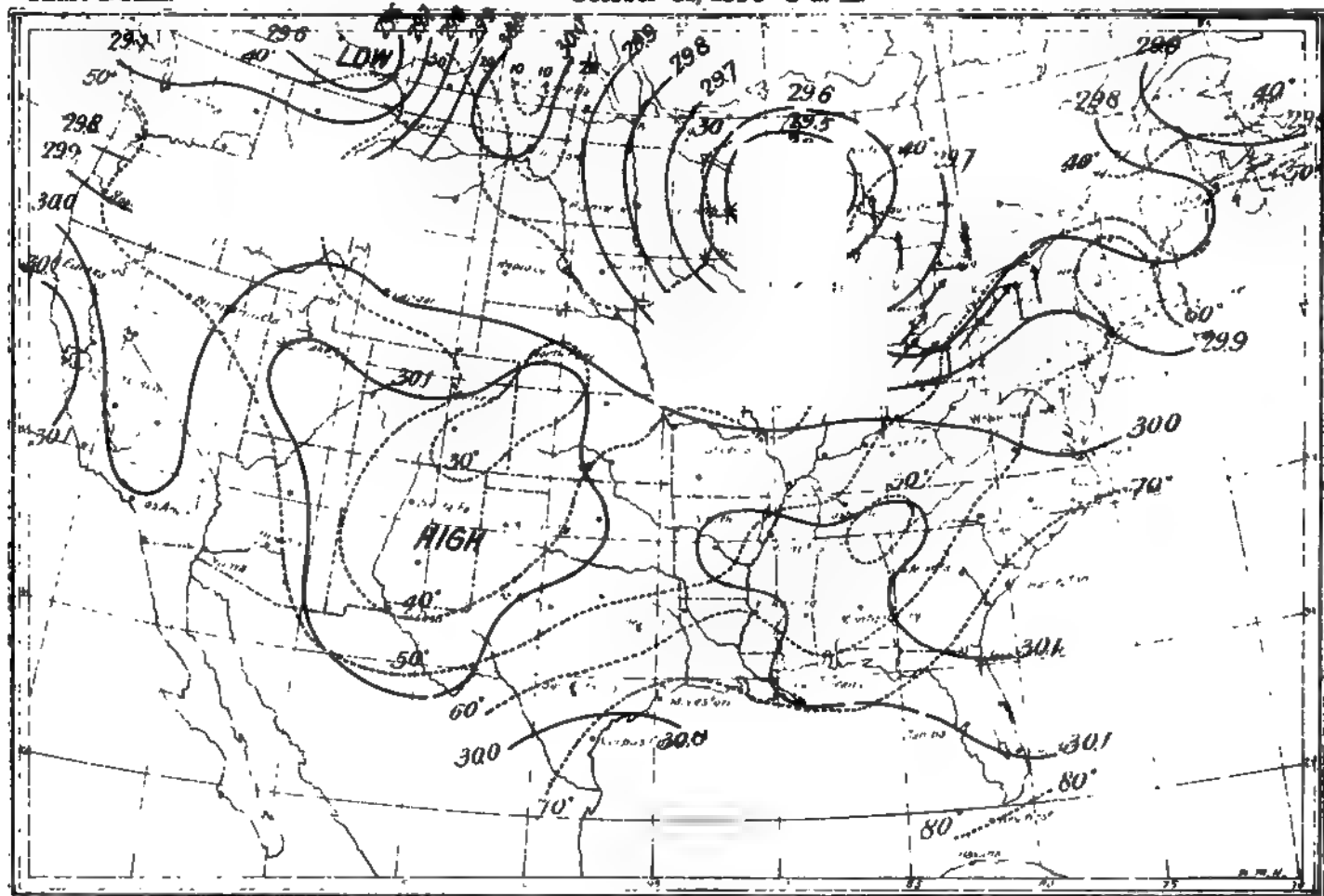


Chart DXXXX.

October 31, 1896—8 a. m.



[illegible]

This is a hand-drawn map of the United States, showing isobars and isotherms. The map includes state boundaries and a latitude/longitude grid. Key features include:

- Isobars:** Solid lines representing pressure. A large 'HIGH' is centered over the Midwest (around 40°N, 100°W). A 'LOW' is located in the Northeast (around 42°N, 70°W). Other isobars are labeled with values like 301, 300, 302, 303, and 304.
- Isotherms:** Dashed lines representing temperature. A 50° isotherm runs from the Gulf of Mexico up to the Great Lakes. A 60° isotherm is located further south, around 30°N to 40°N.
- Geographic Labels:** 'USA' is written in the lower-left quadrant. 'HIGH' and 'LOW' are written near their respective pressure centers.
- Grid:** Latitude lines are marked at 30°, 40°, 50°, and 60°N. Longitude lines are marked at 100°, 90°, 80°, 70°, 60°, and 50°W.

A hand-drawn map of the United States showing isobars and isotherms. The map includes latitude and longitude lines. A large high-pressure system is centered over the Great Lakes region, with a low-pressure system to its north. Isotherms for 50°F and 60°F are shown, generally increasing from north to south. The map includes labels for 'HIGH' and 'LOW' pressure systems.

Chart DOXLIII.

October 18, 1898—8 a. m.

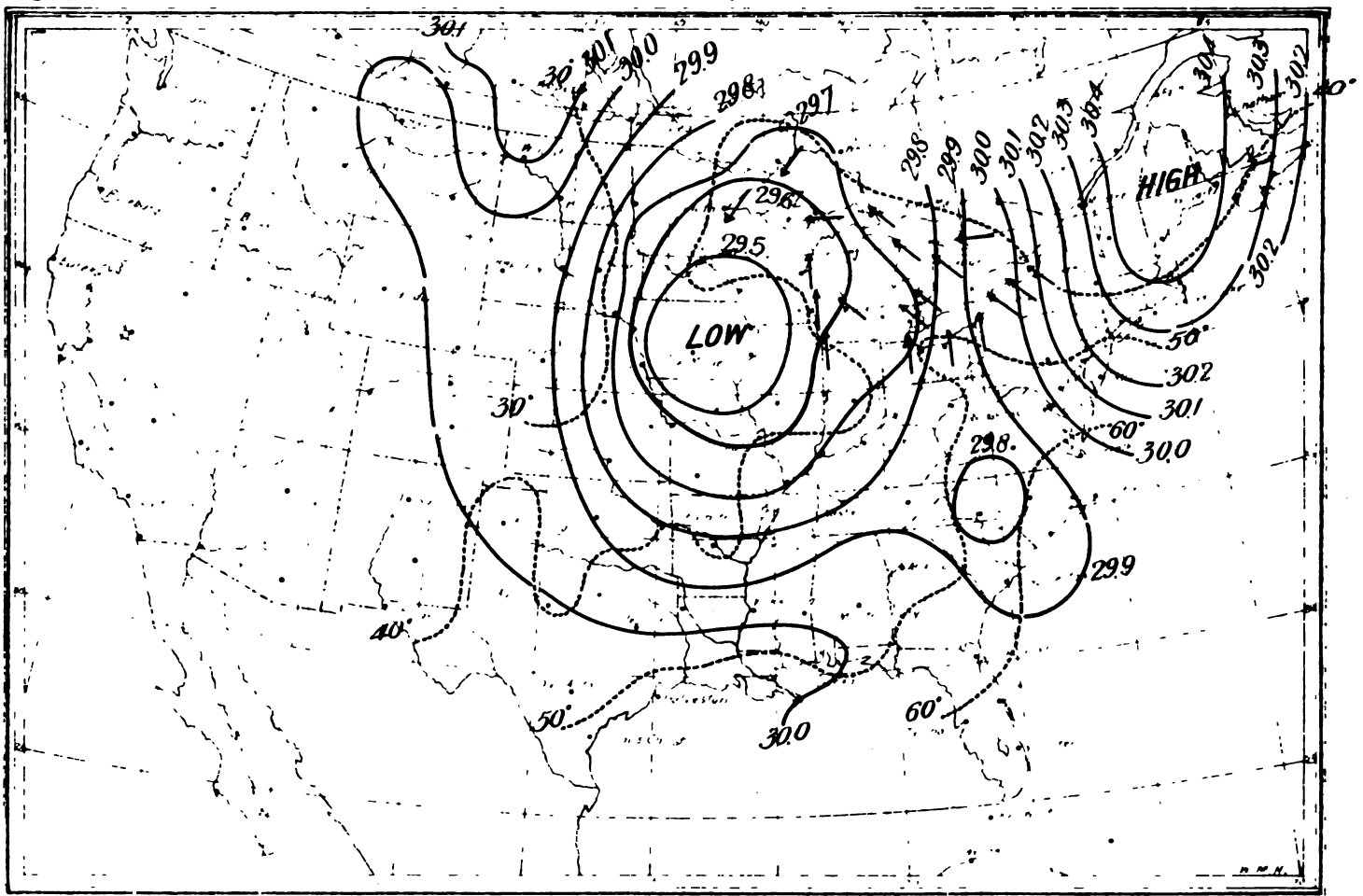


Chart DOXLIV.

October 18, 1898—8 p. m.

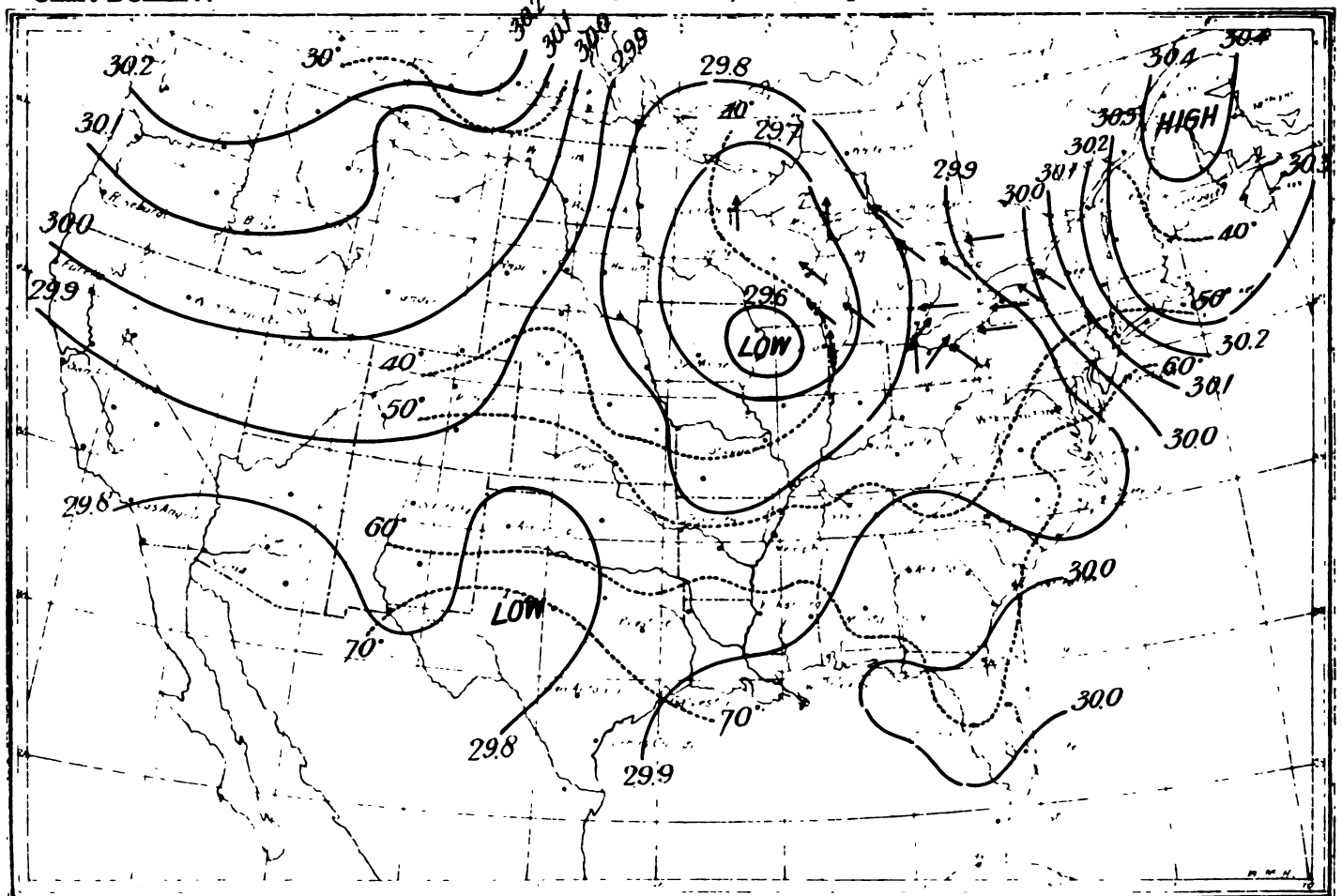


Chart DOXLV.

October 24, 1898—8 a. m.

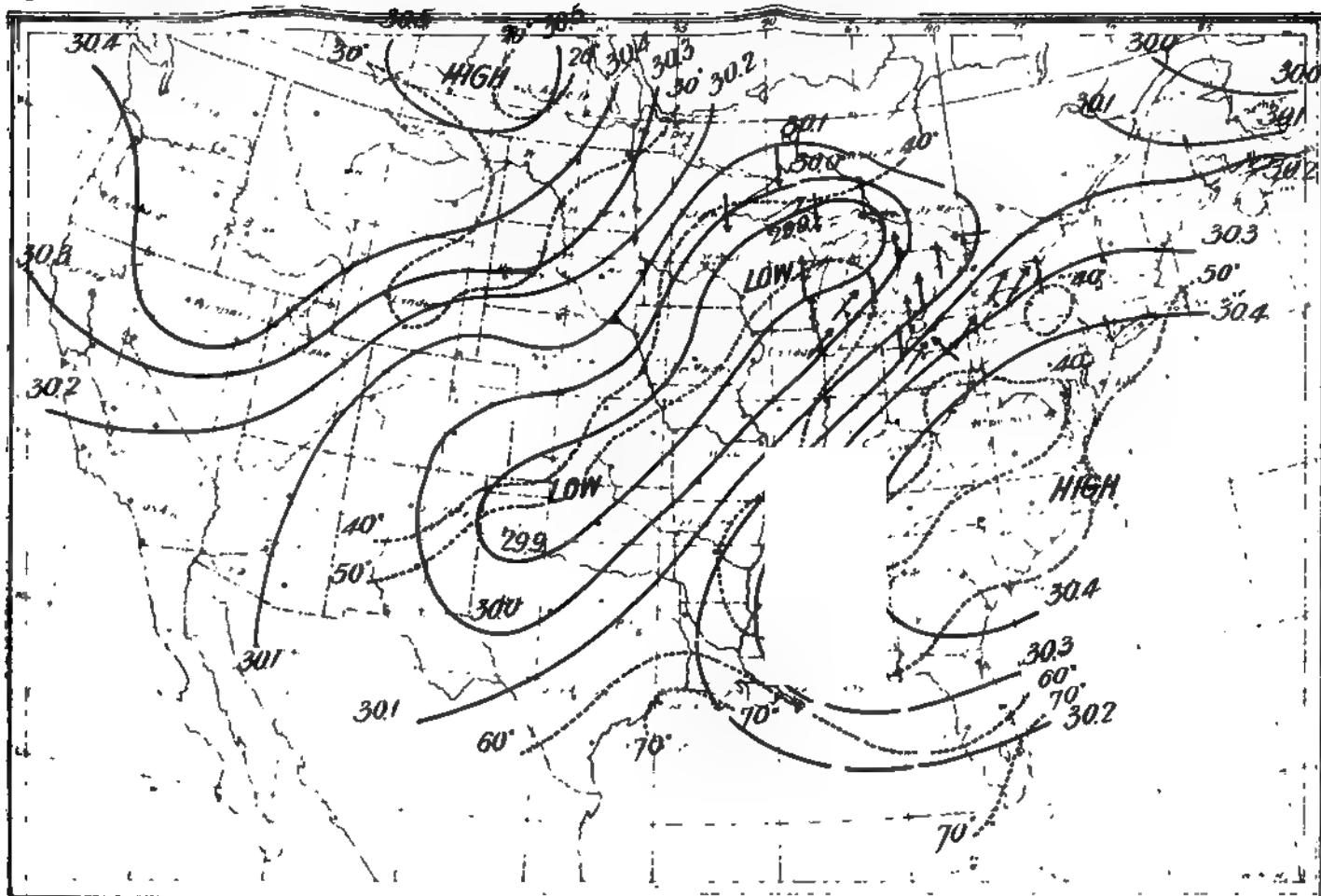


Chart DOXLVI.

October 24, 1898—8 p. m.

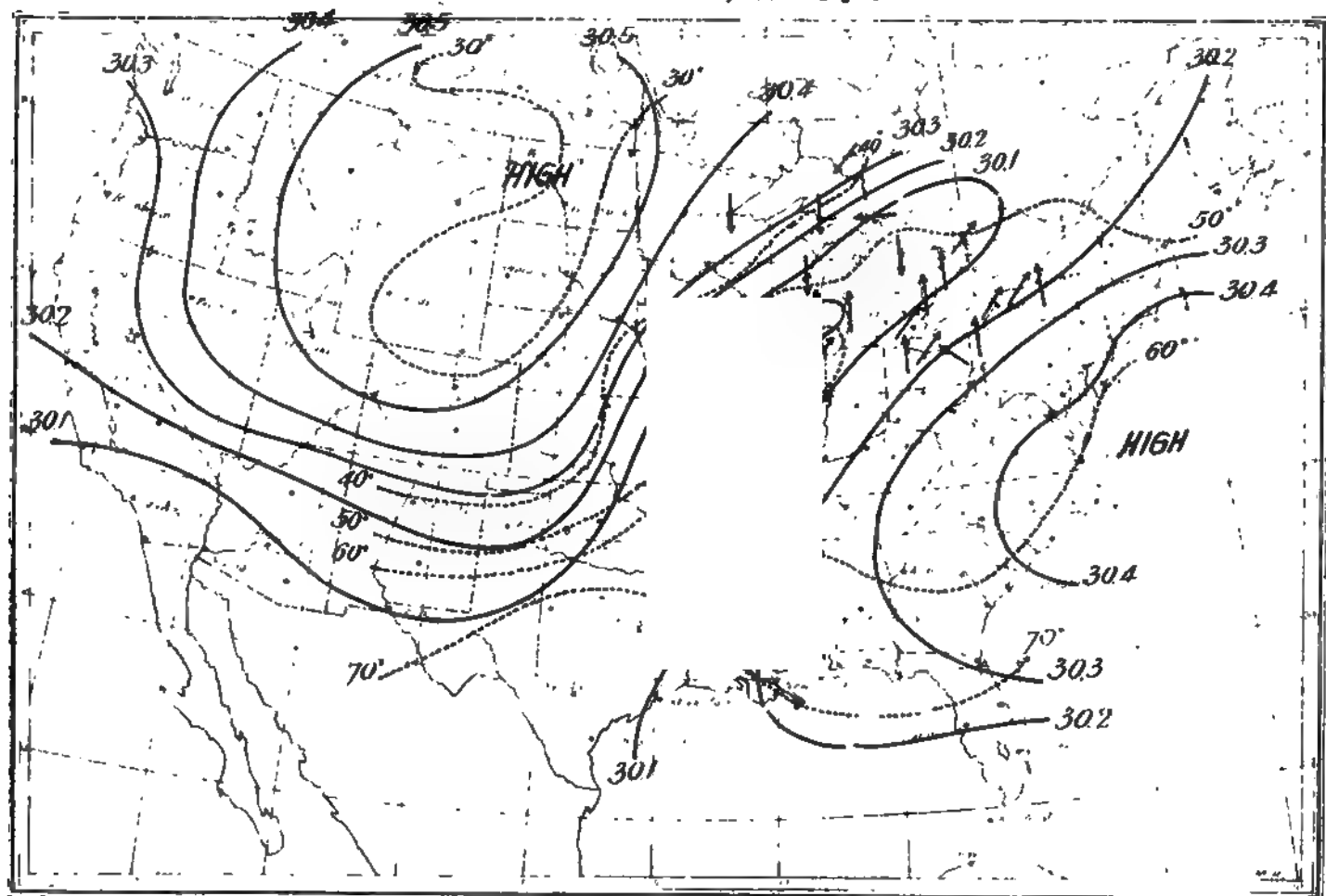


Chart DOXLVII.

October 25, 1898—8 a. m.

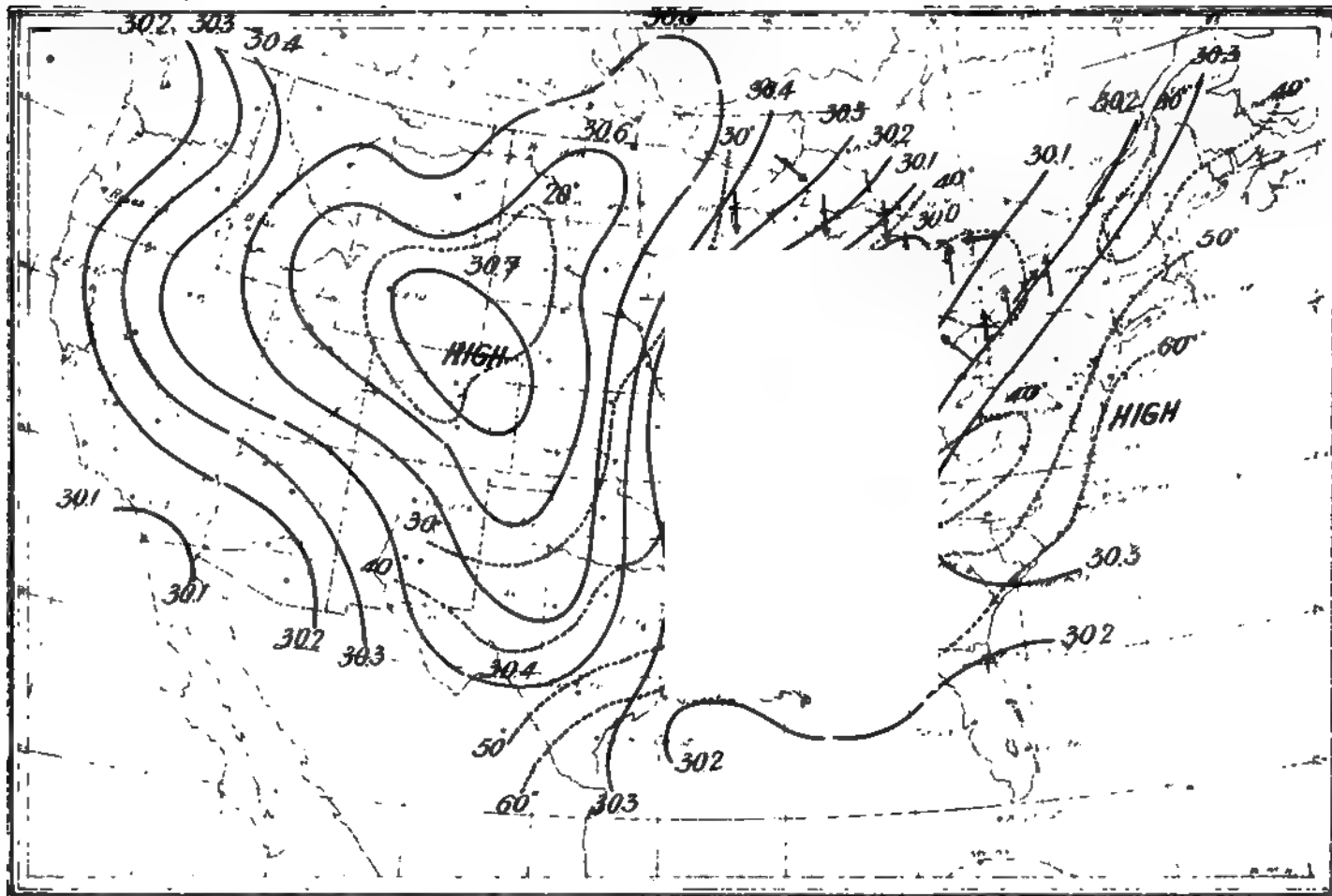


Chart DOXLVIII.

October 25, 1898—8 p. m.

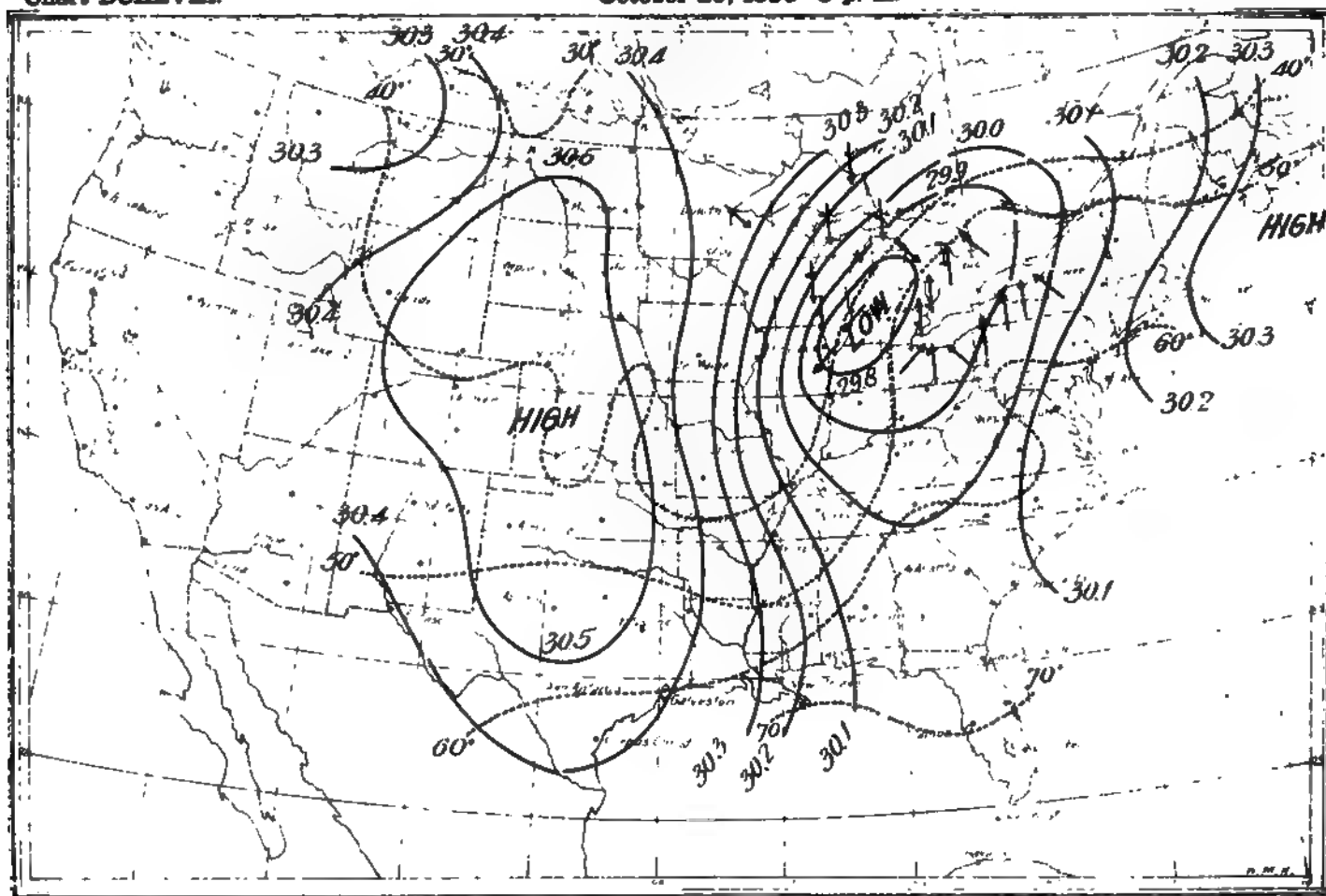


Chart DOKLIX

November 1, 1876—7:35 a. m.

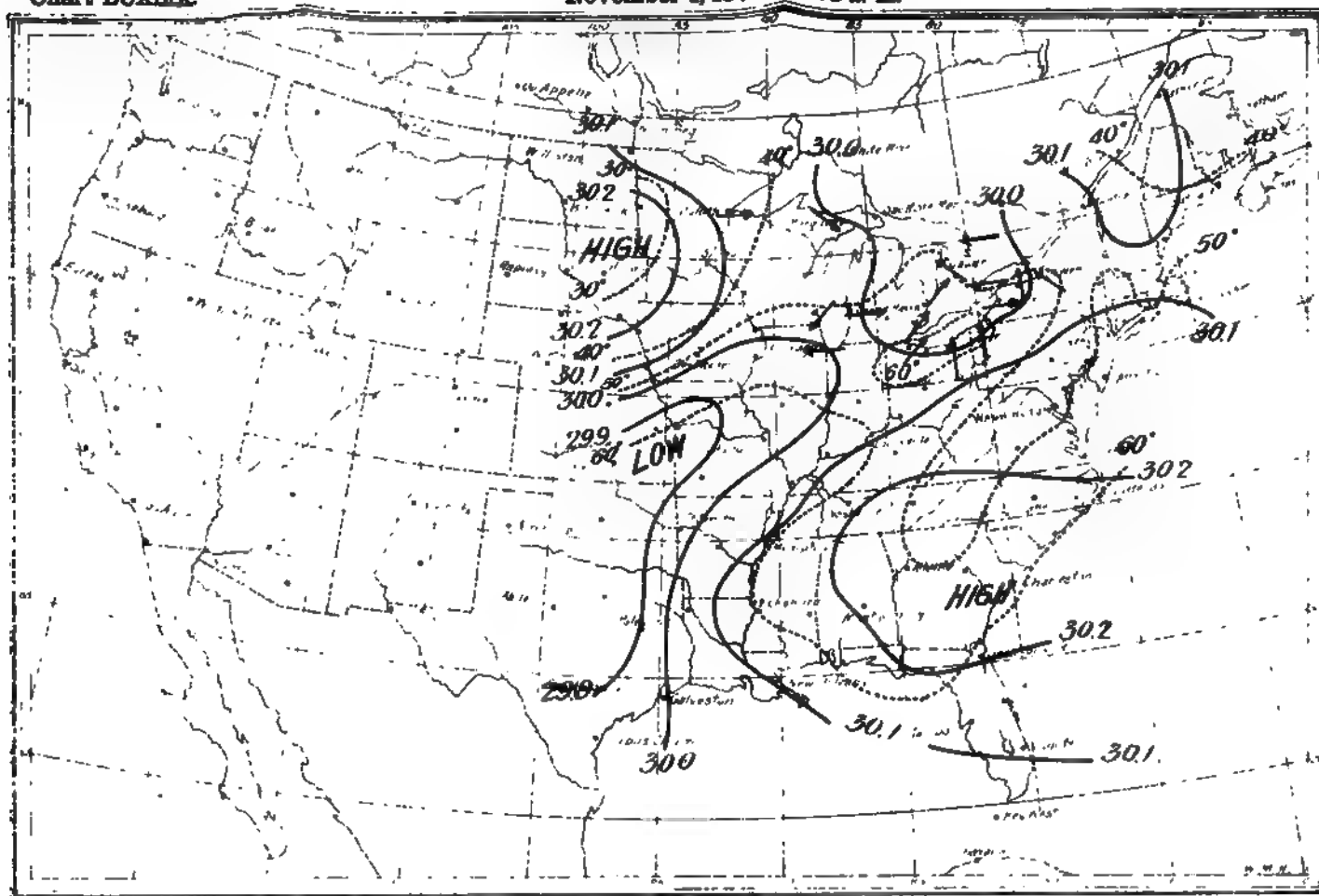


Chart DOL

November 1, 1876—4:35 p. m.

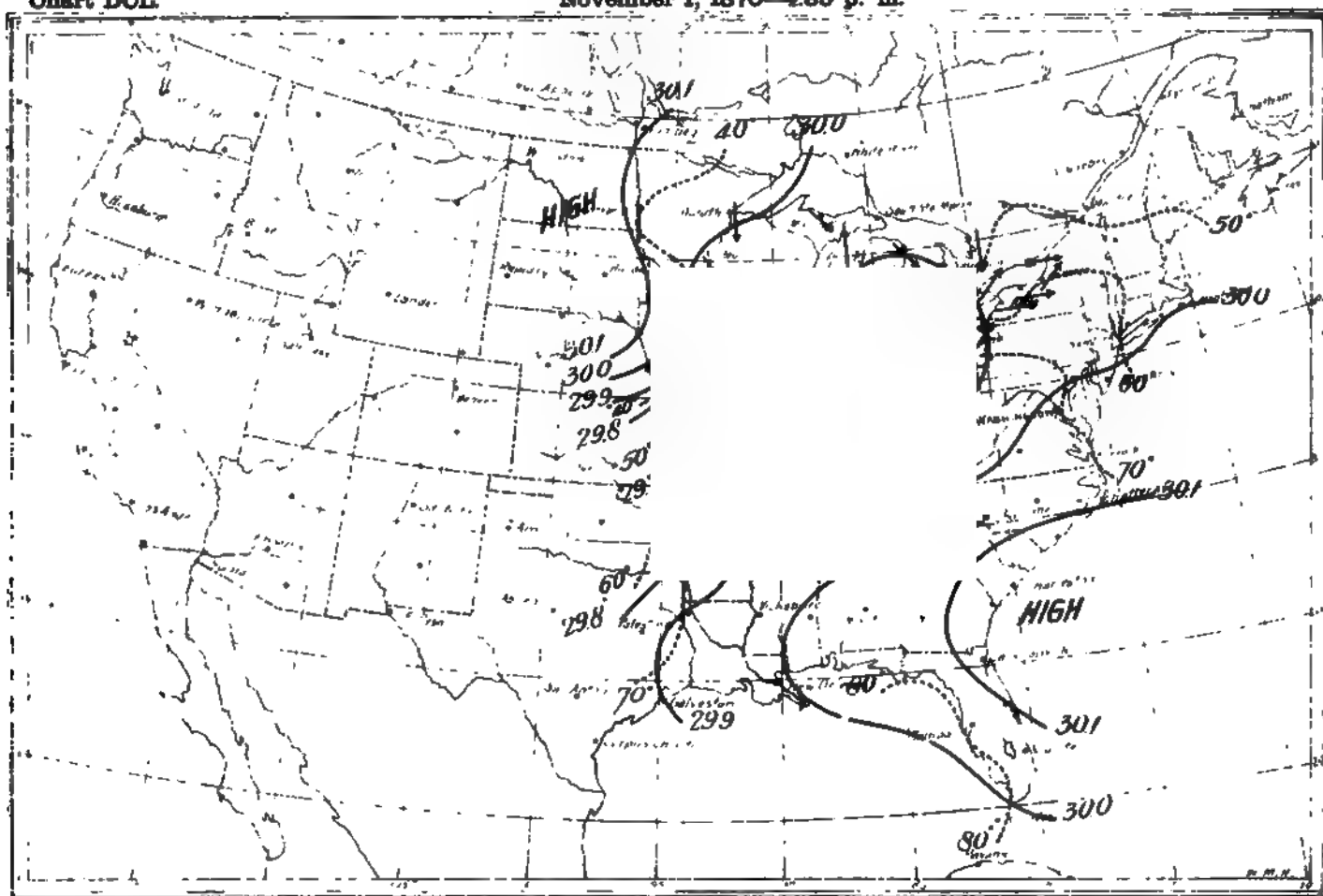


Chart DOLL

November 2, 1876—7:35 a. m.

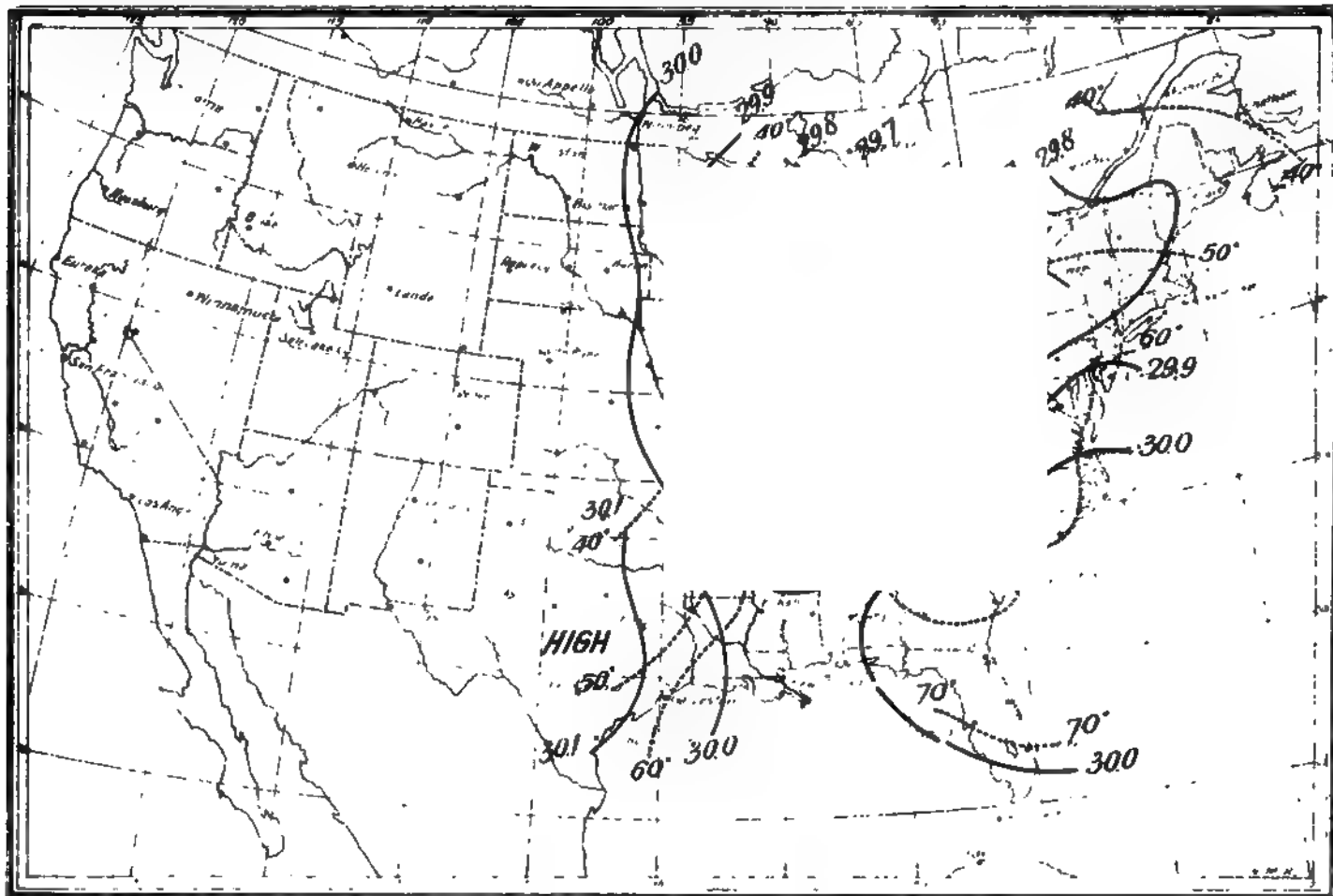


Chart DOLL

November 2, 1876—4:35 p. m.

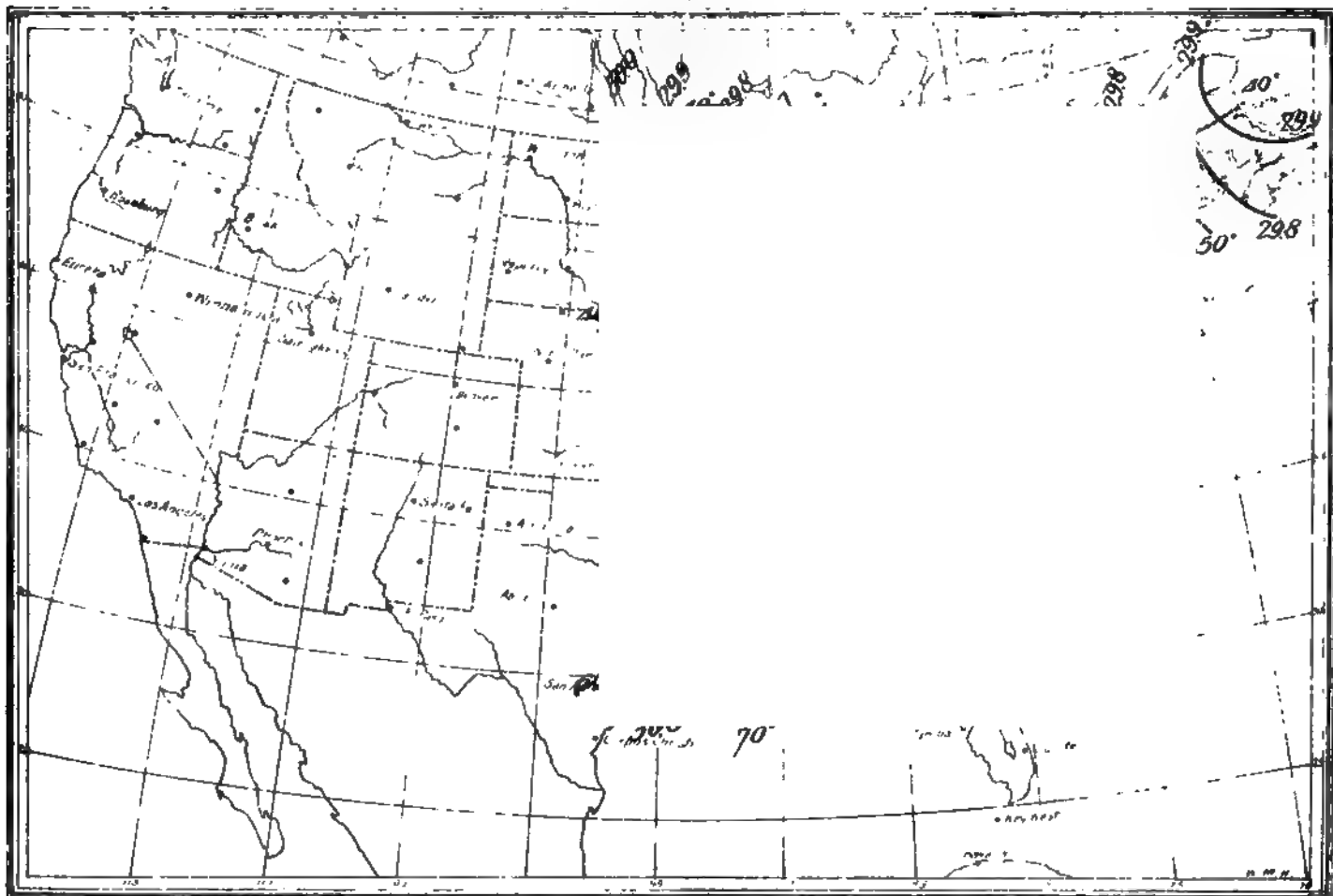


Chart DOLV.

November 2, 1877—7:35 a. m.

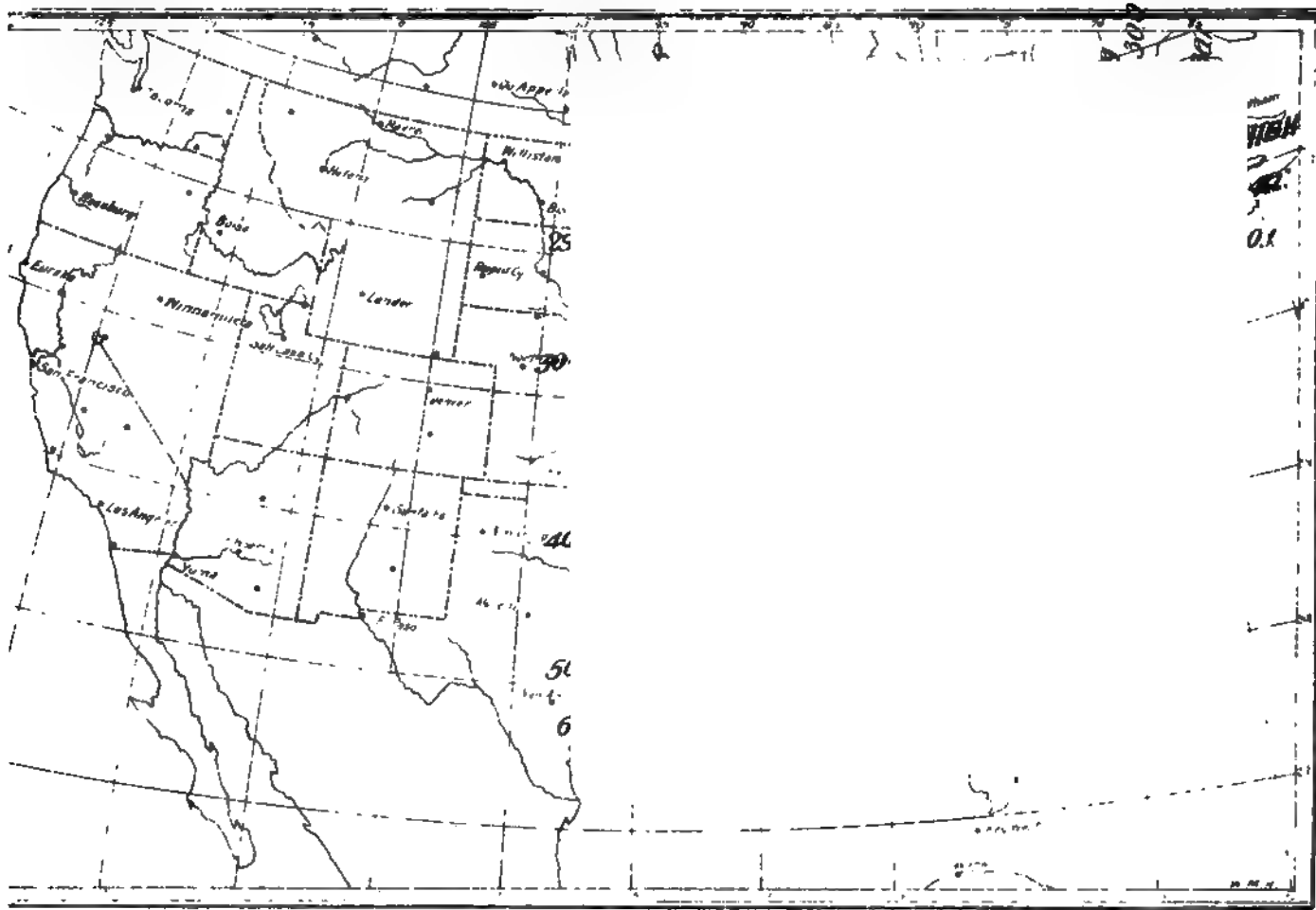


Chart DOLVI.

November 2, 1877—4:35 p. m.

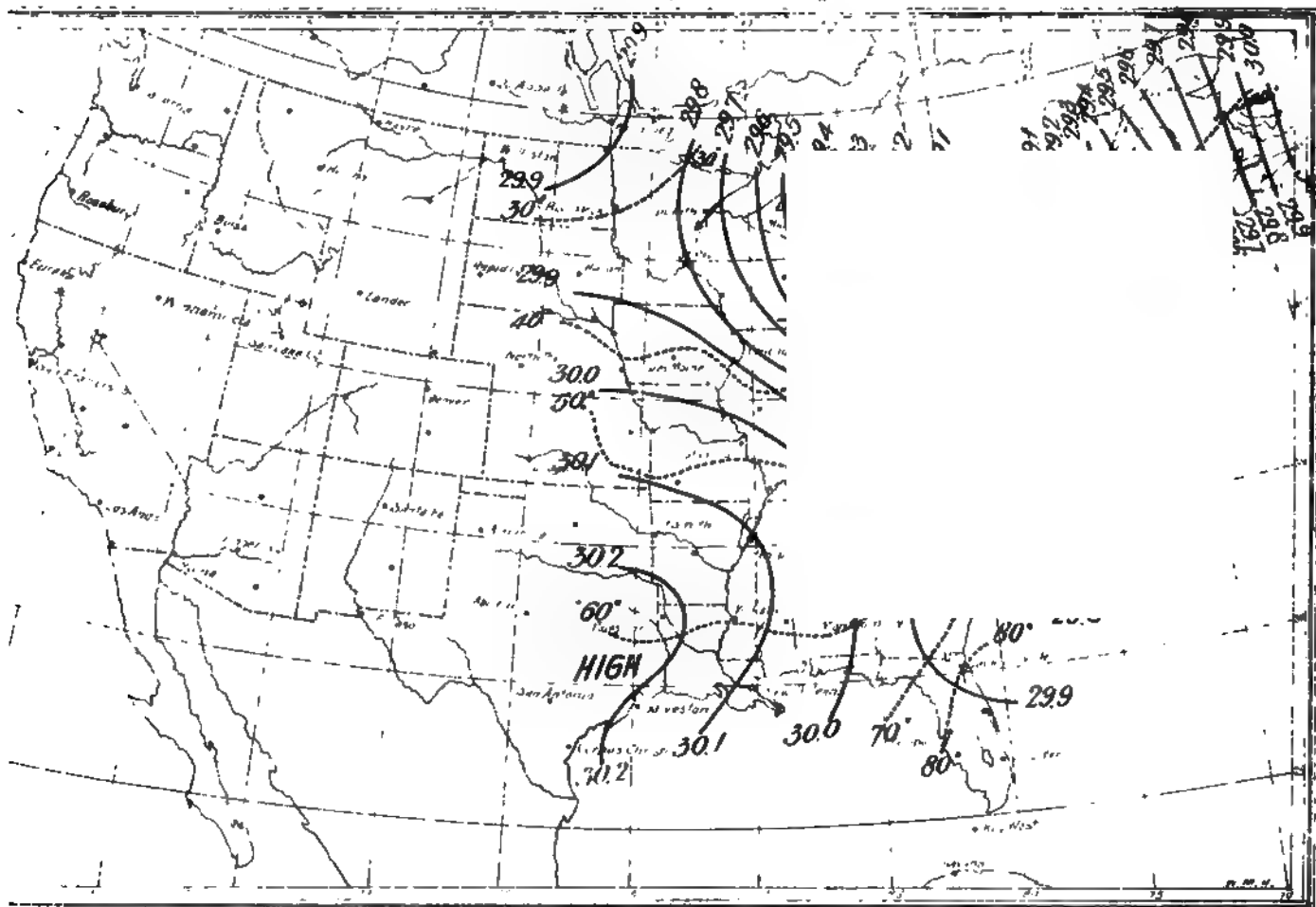


Chart DCLVII.

November 7, 1877—7:35 a. m.

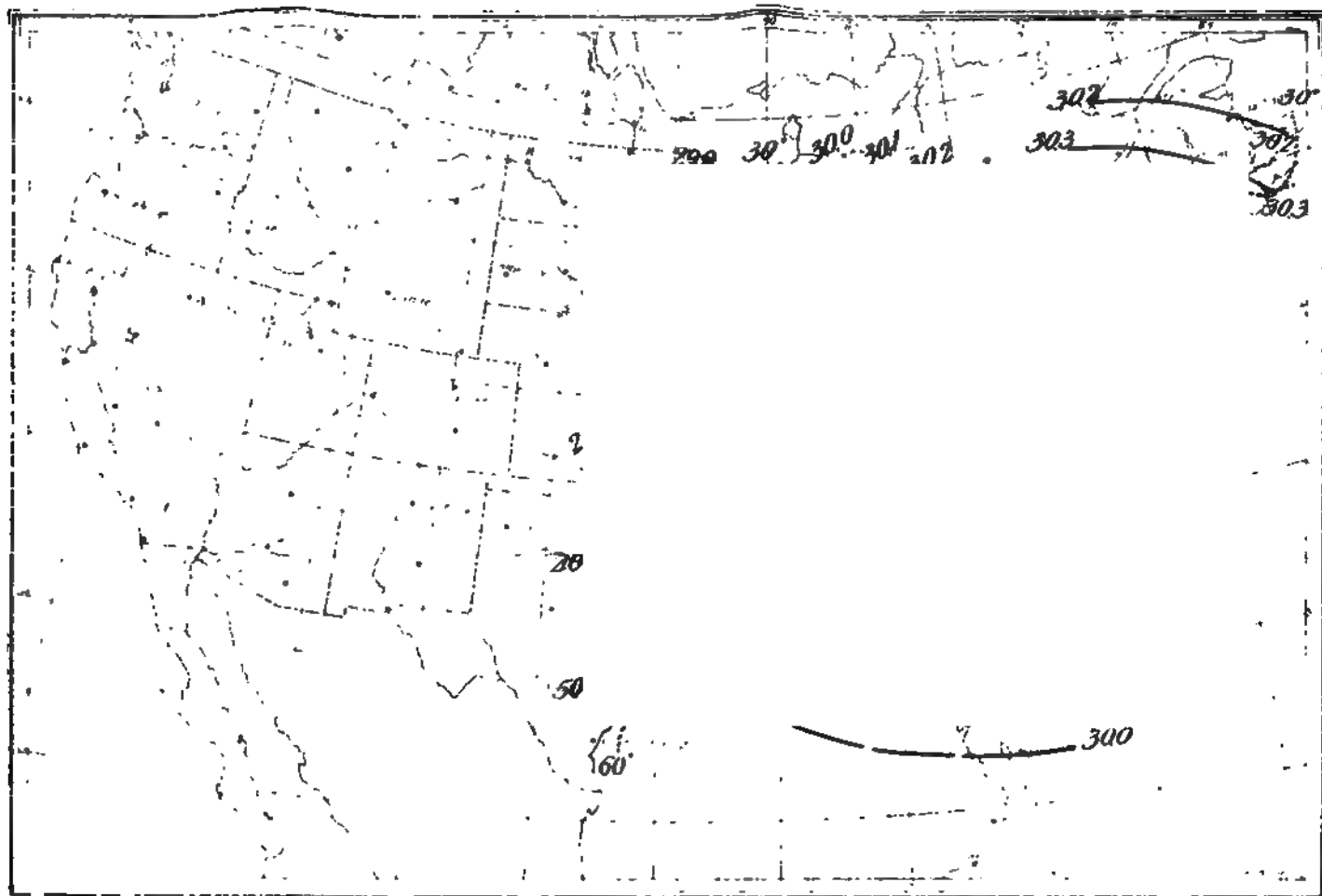


Chart DCLVIII.

November 7, 1877—4:35 p. m.

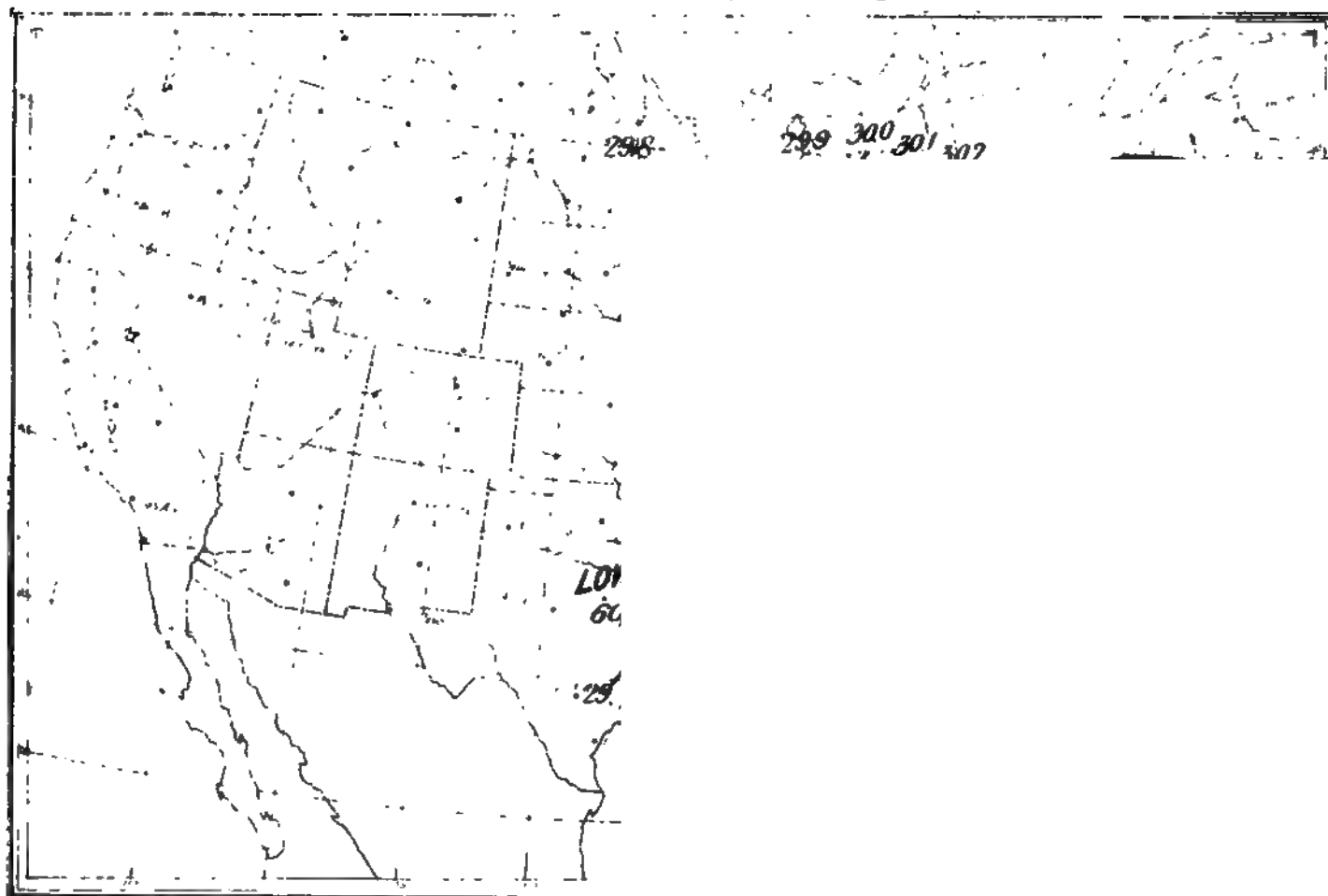


Chart DOLIX.

November 8, 1877—7:35 a. m.

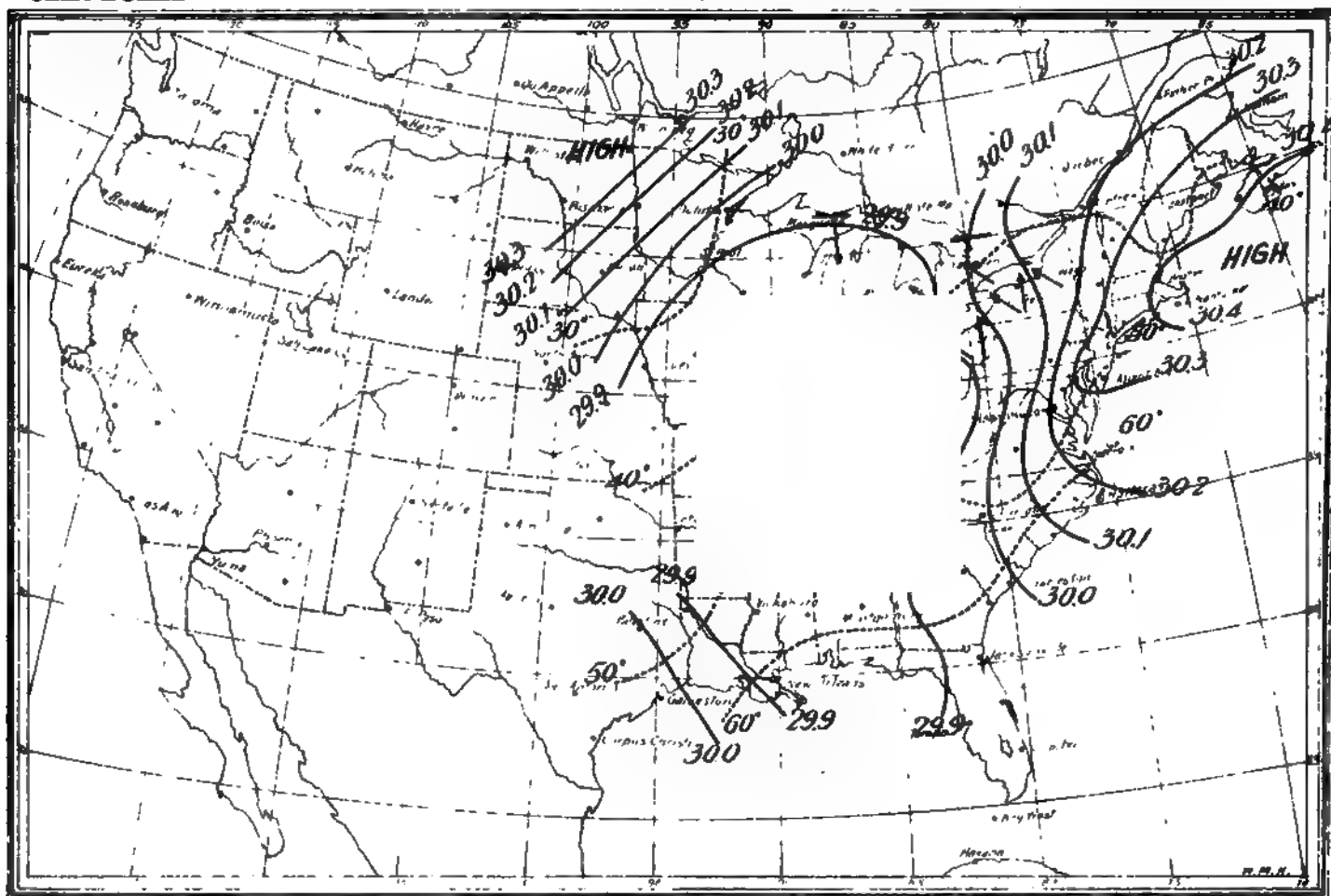


Chart DOLIX.

November 8, 1877—4:35 p. m.

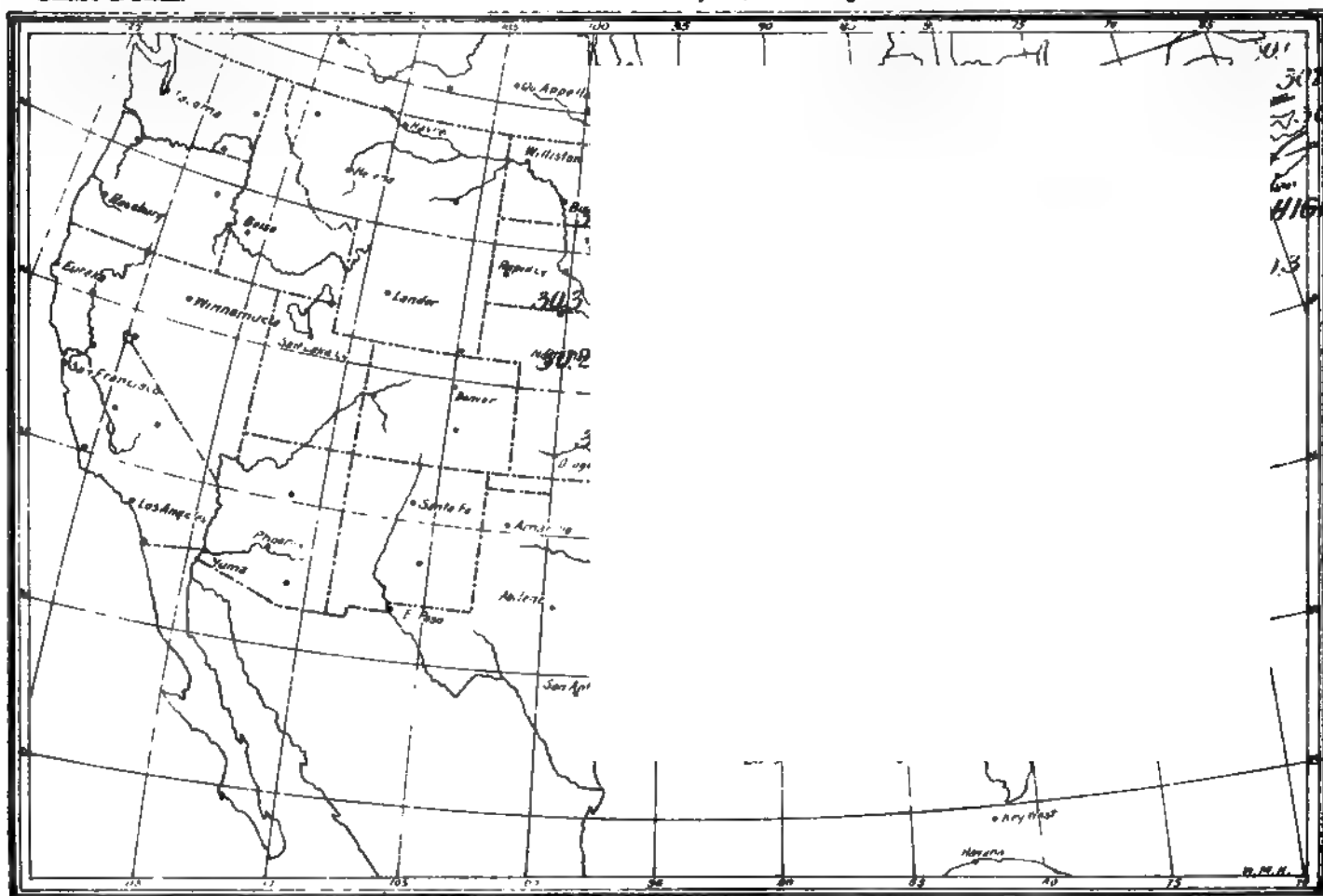


Chart DOLXI.

November 5, 1878—4:35 p. m.

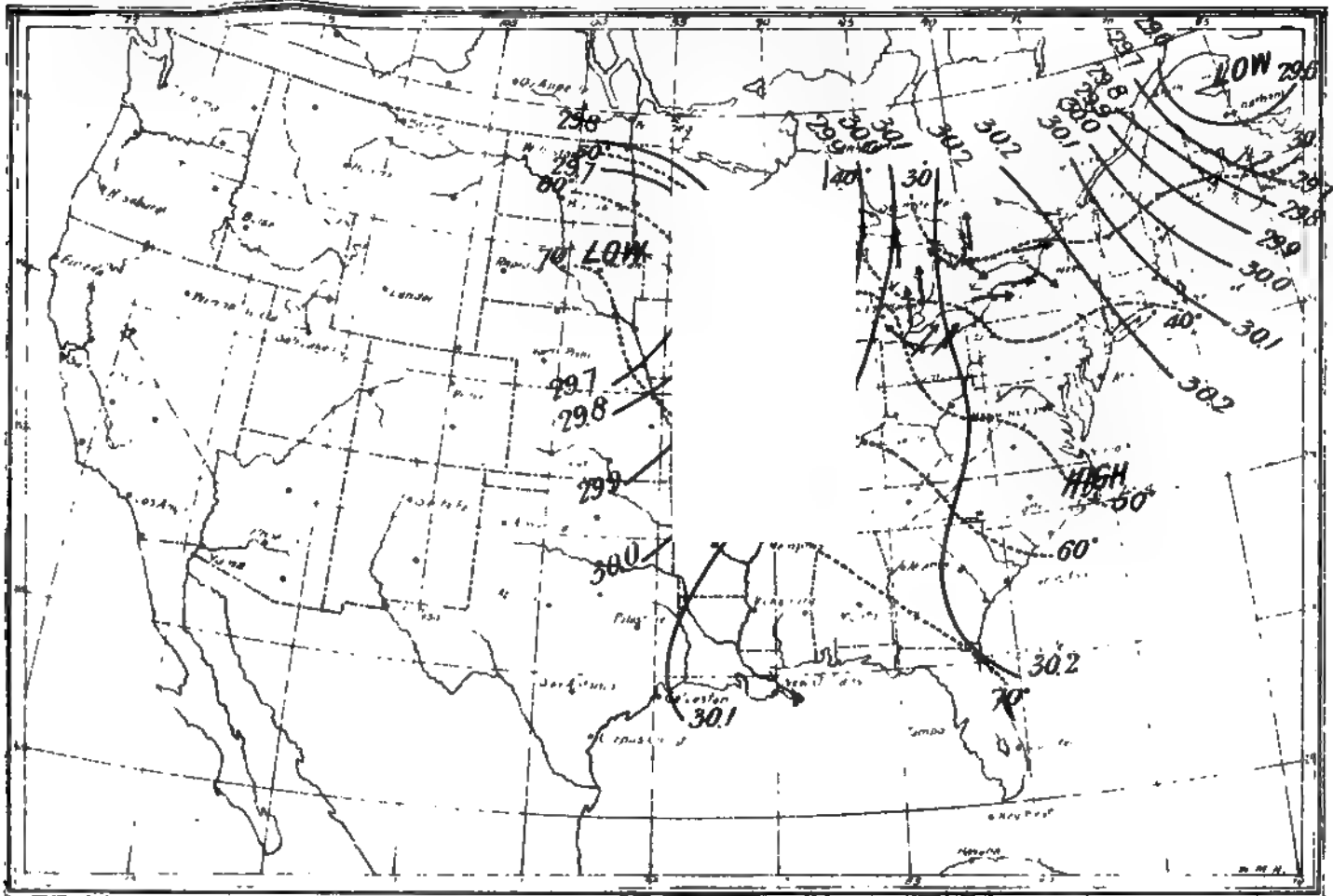


Chart DOLXII.

November 6, 1878—7:35 a. m.

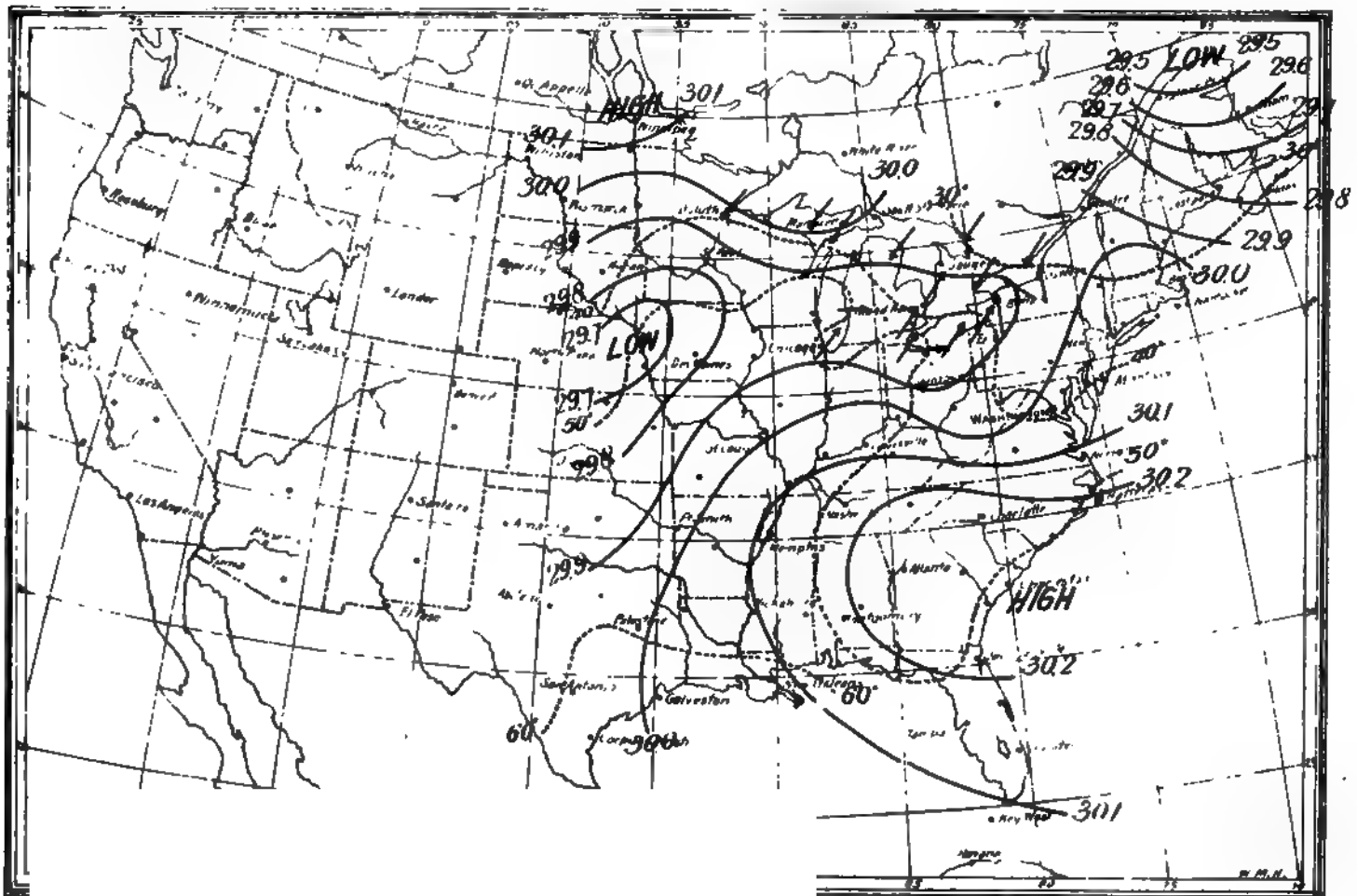


Chart DOLXIII.

November 6, 1878—4:35 p. m.

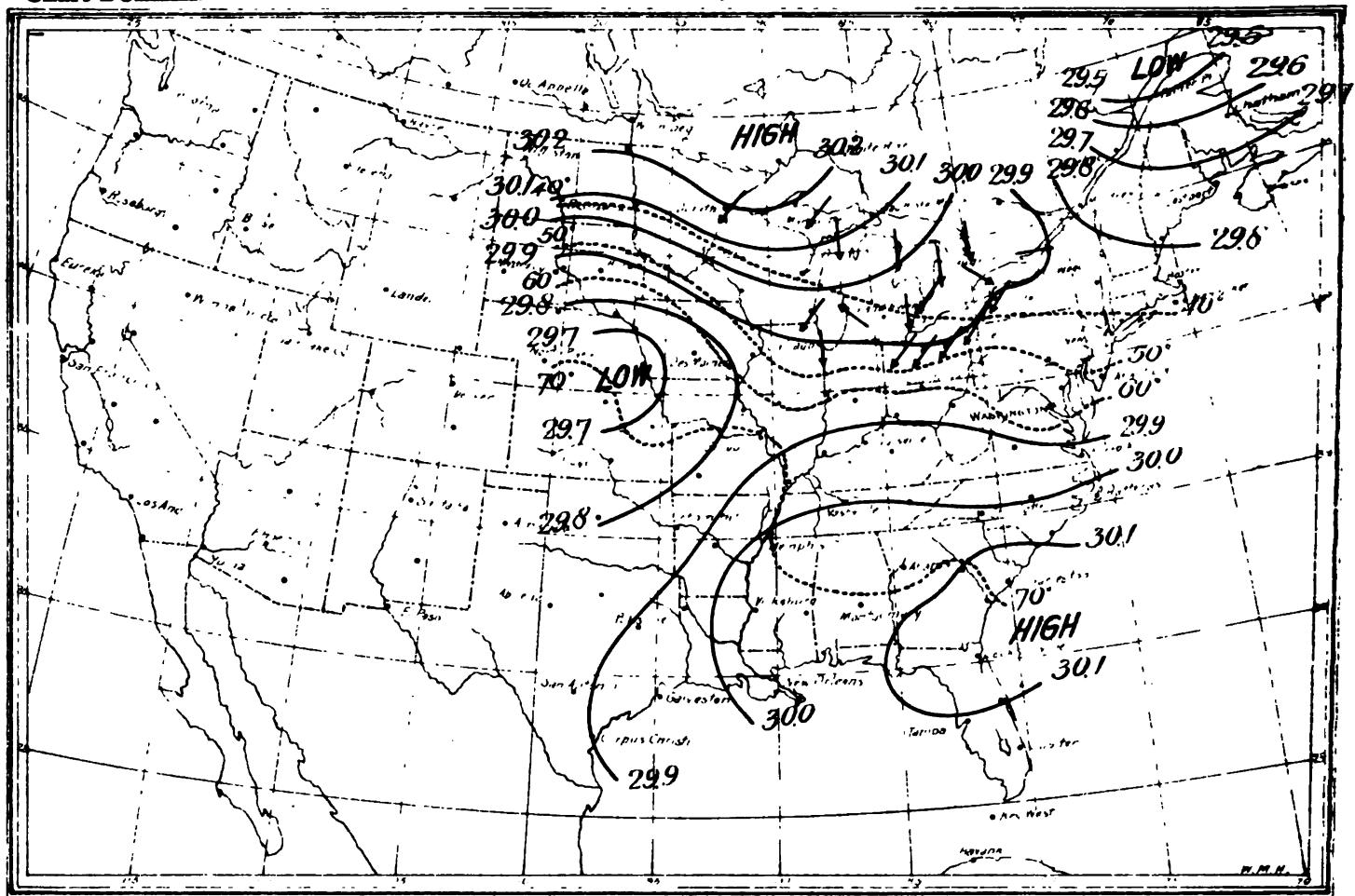


Chart DOLXIV.

November 7, 1878—7:35 a. m.

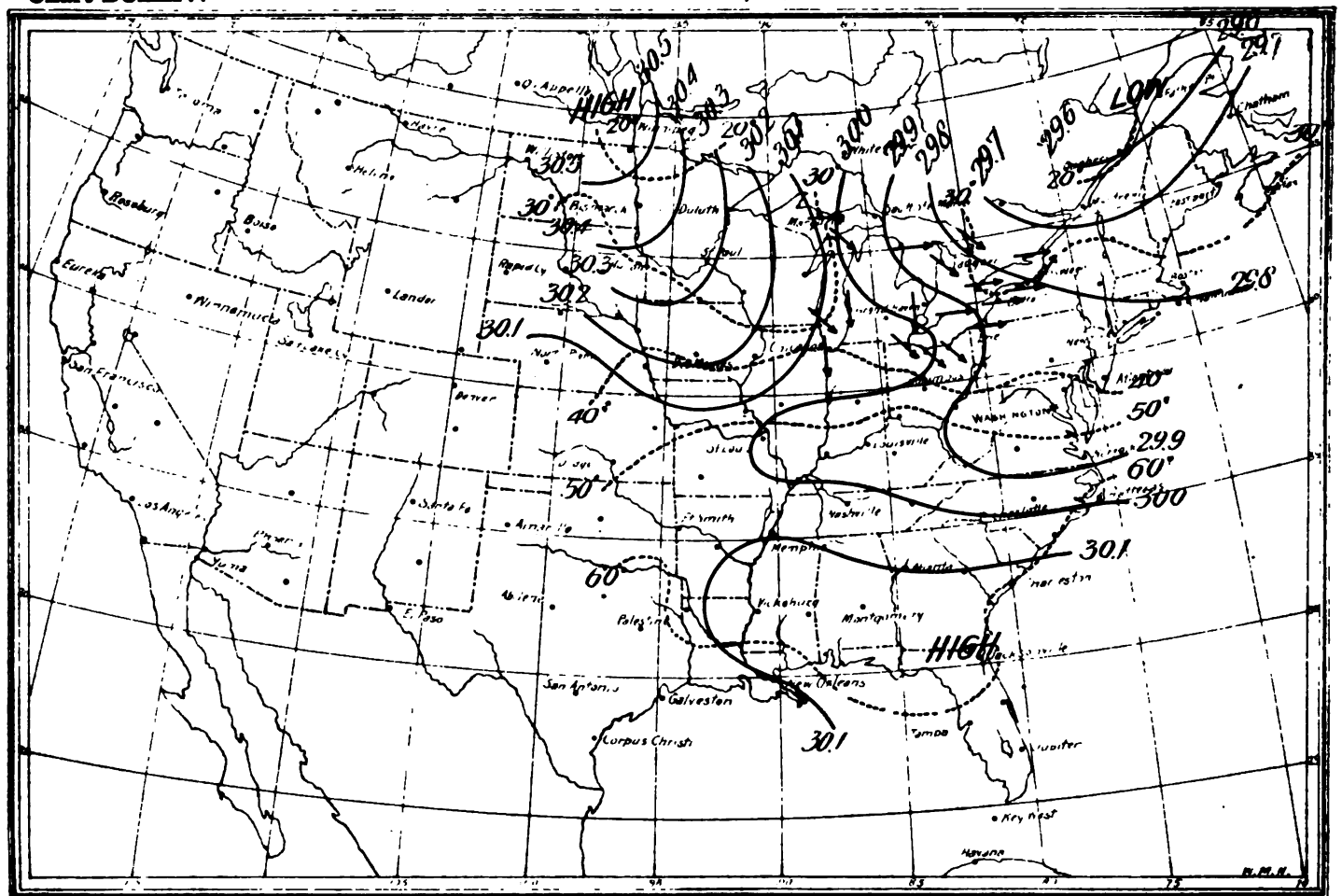


Chart DOLXV.

November 1, 1879—7 a. m.

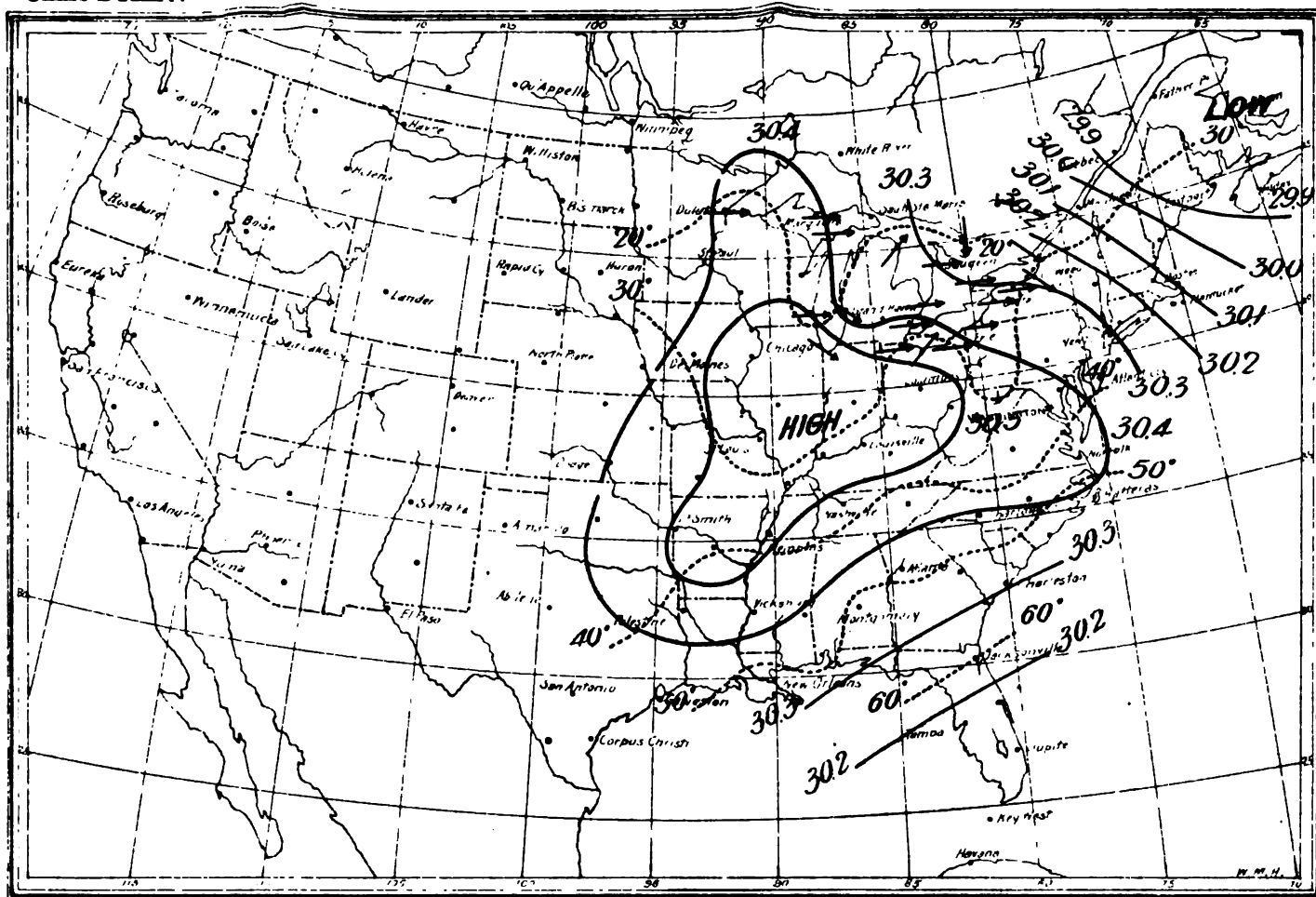


Chart DOLXVI.

November 1, 1879—8 p. m.

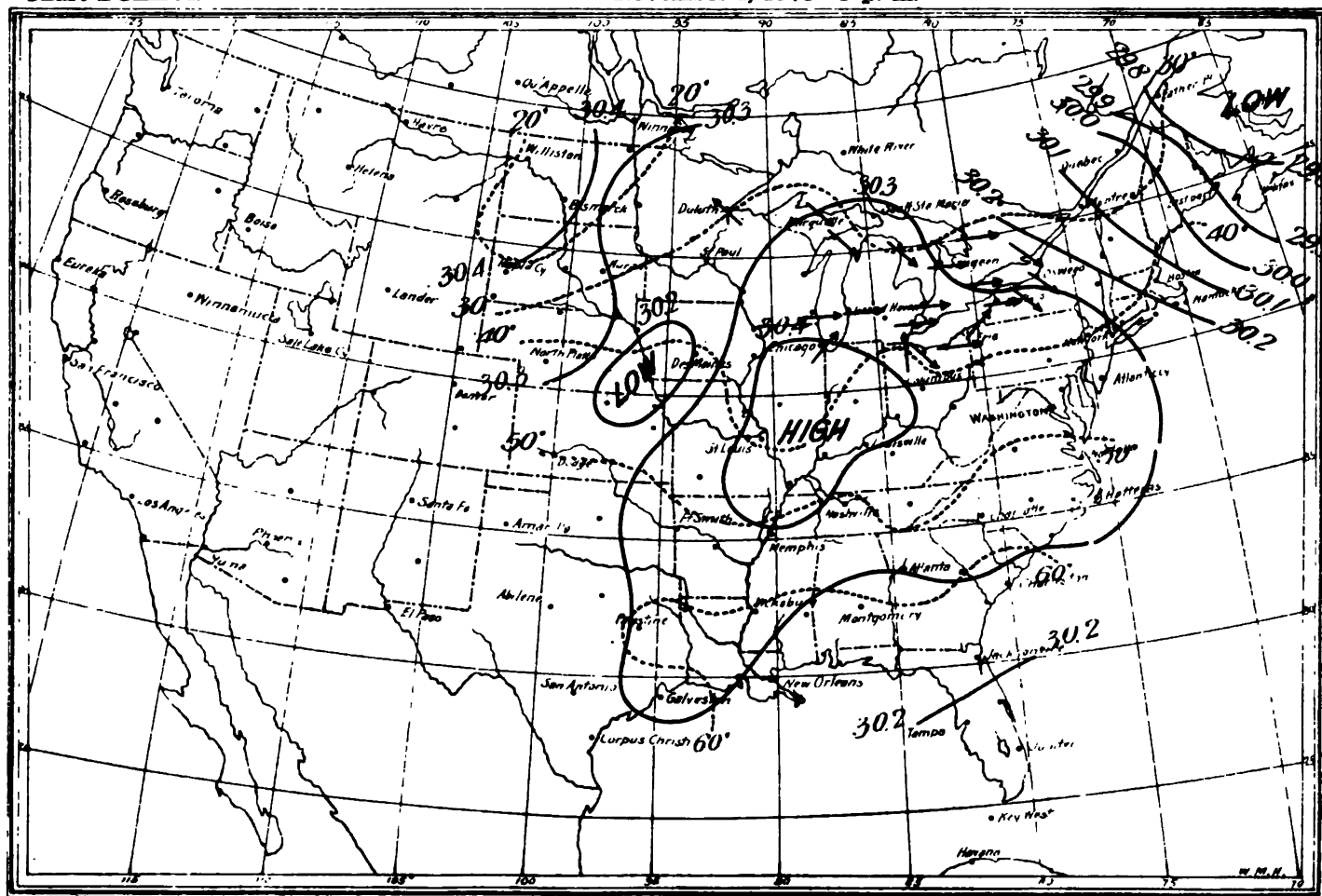


Chart DOLXVII.

November 2, 1879—7 a. m.

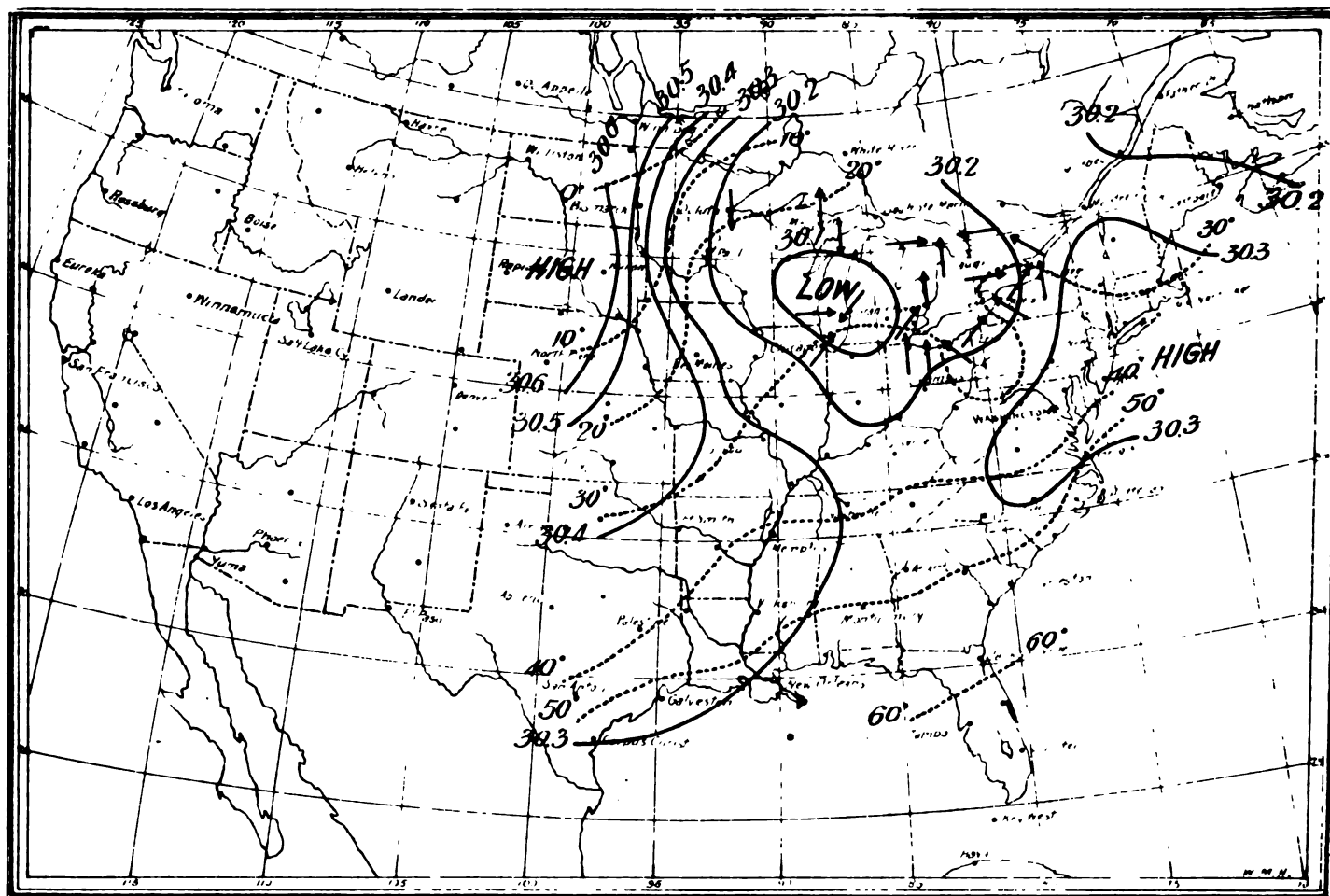


Chart DOLXVIII.

November 2, 1879—3 p. m.

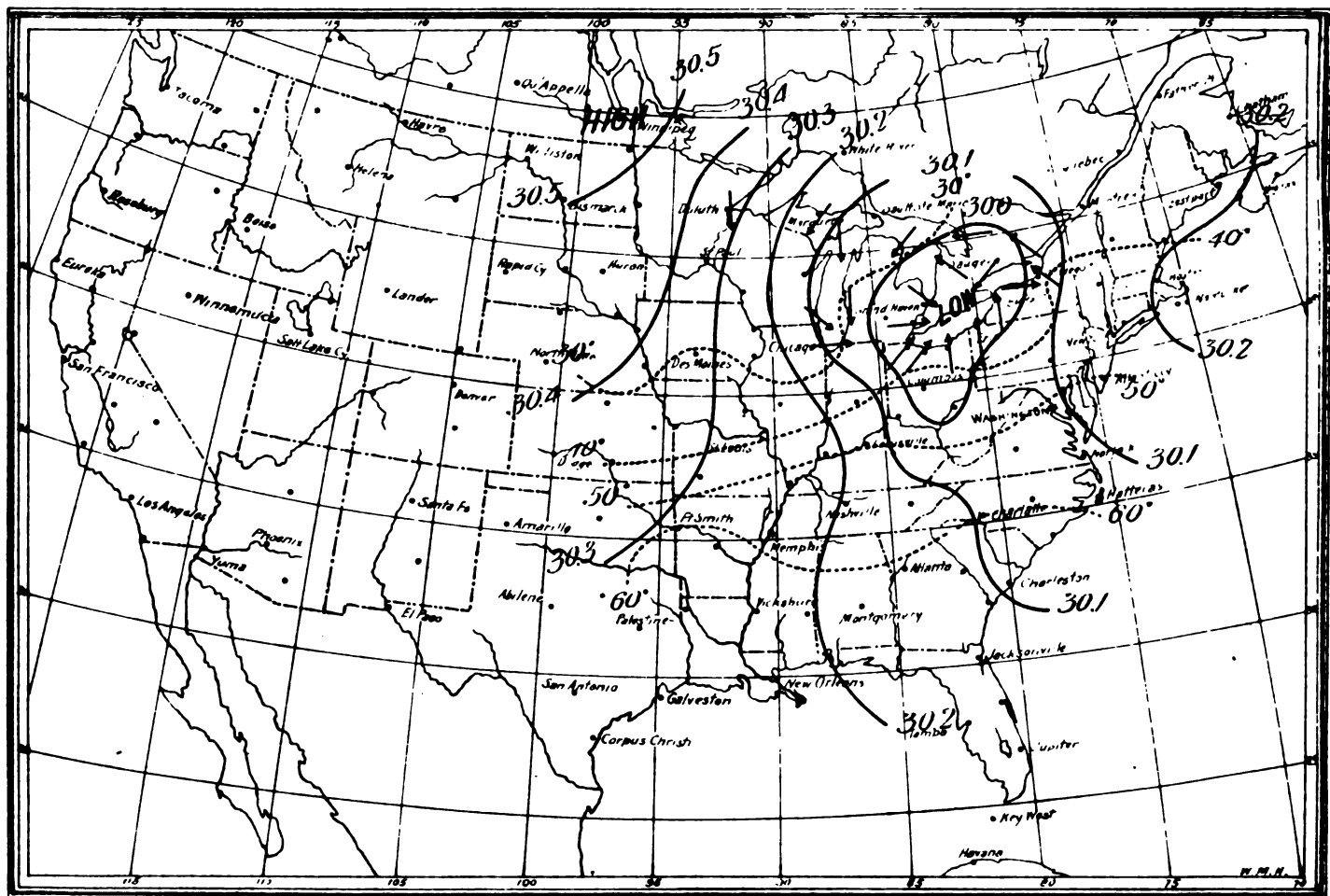


Chart DOLXIX.

November 18, 1879—8 p. m.

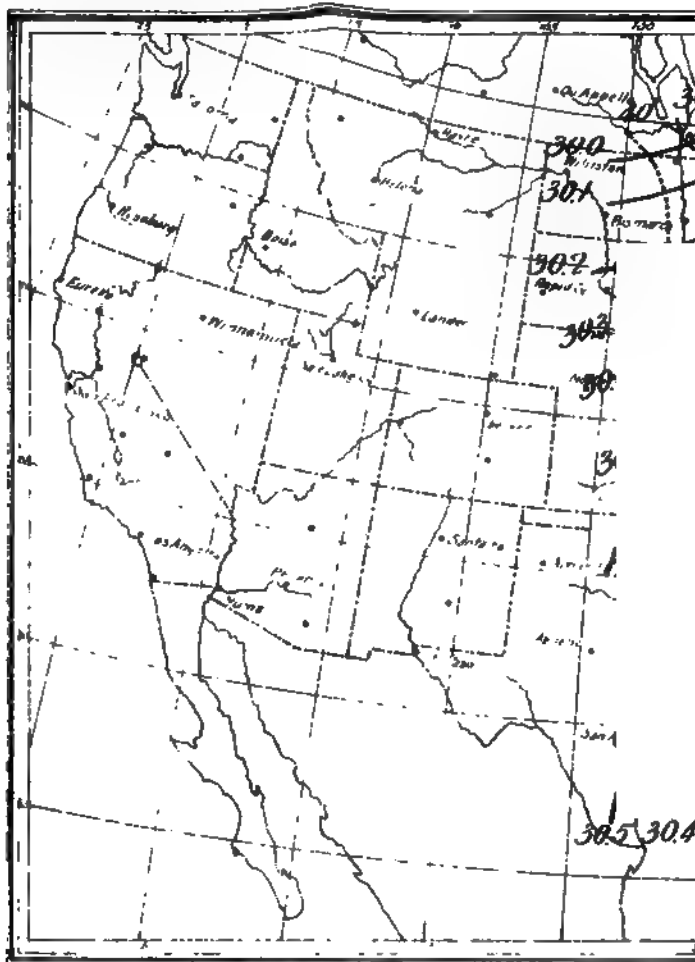


Chart DOLXX.

November 19, 1879—7 a. m.

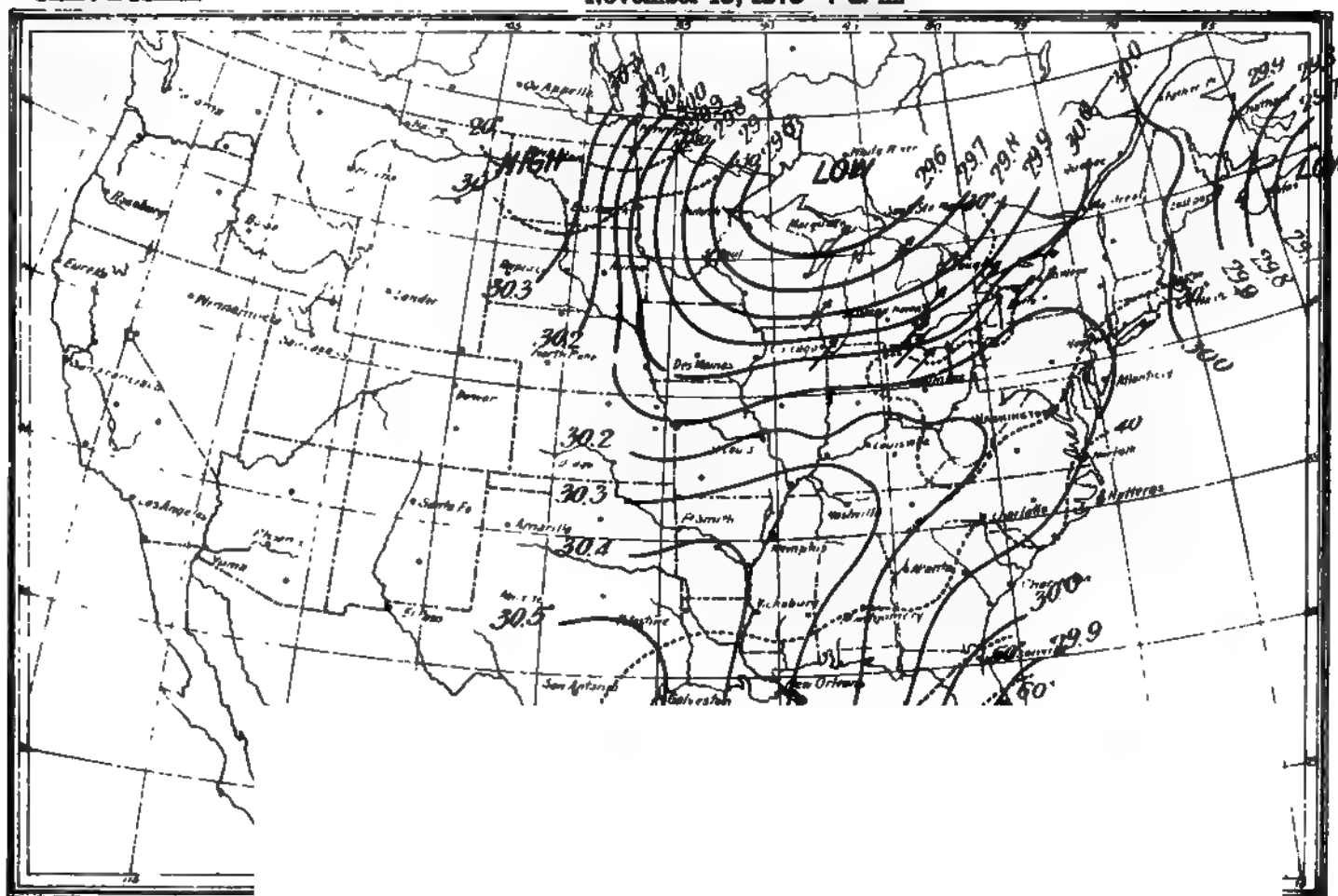


Chart DOLXXI.

November 19, 1879—8 p. m.

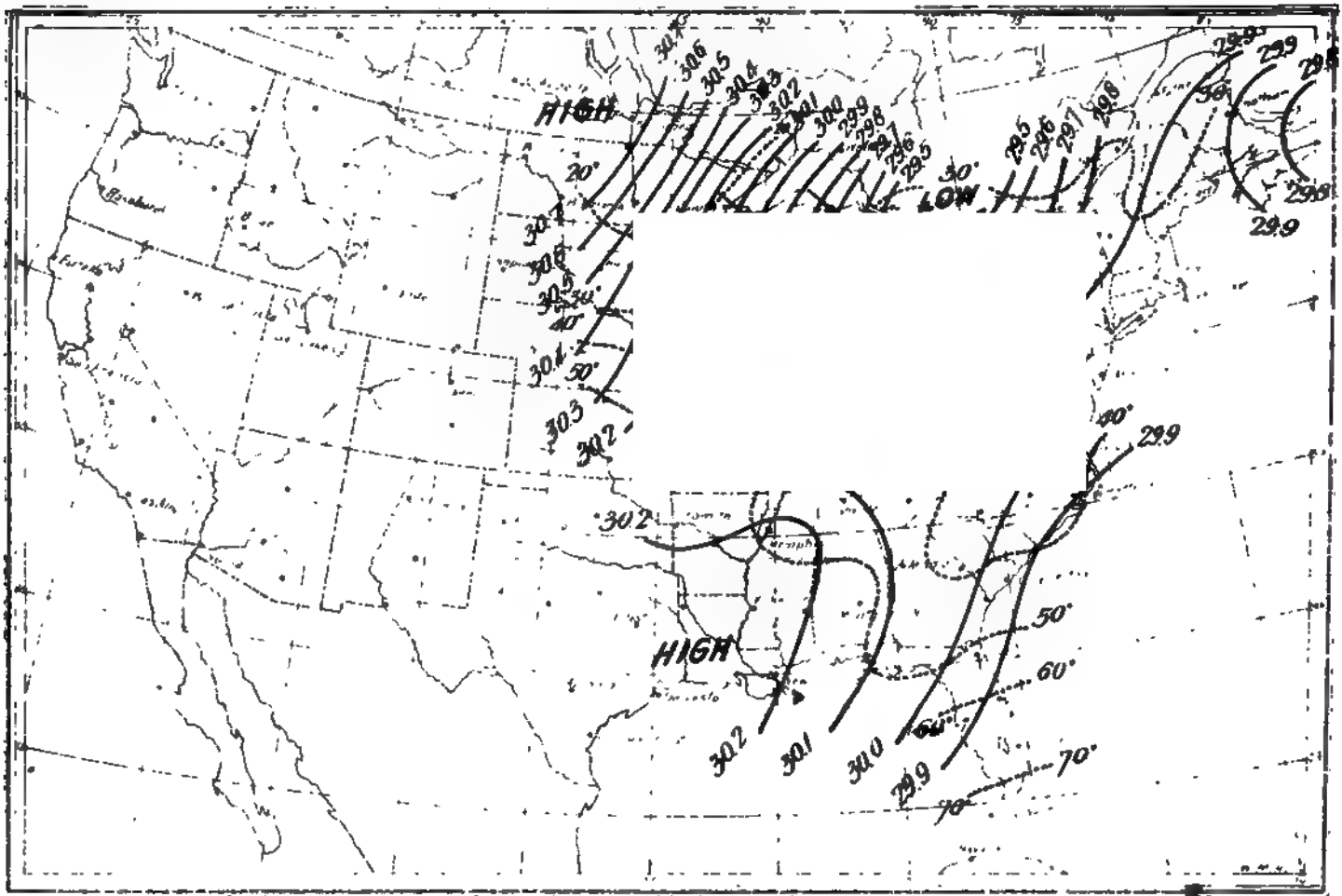


Chart DOLXXII.

November 20, 1879—7 a. m.

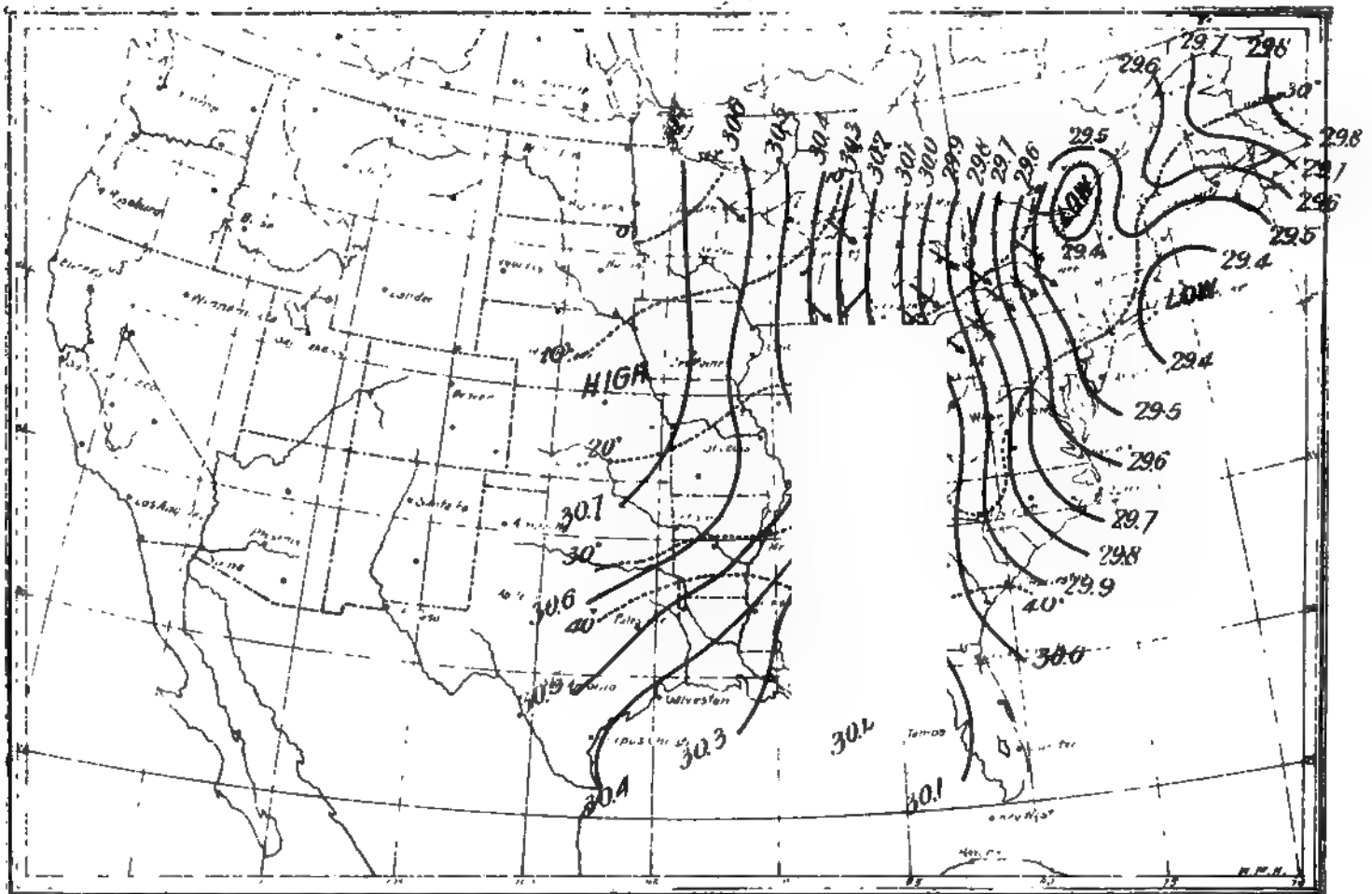


Chart DOLXXIII.

November 27, 1879—7 a. m.

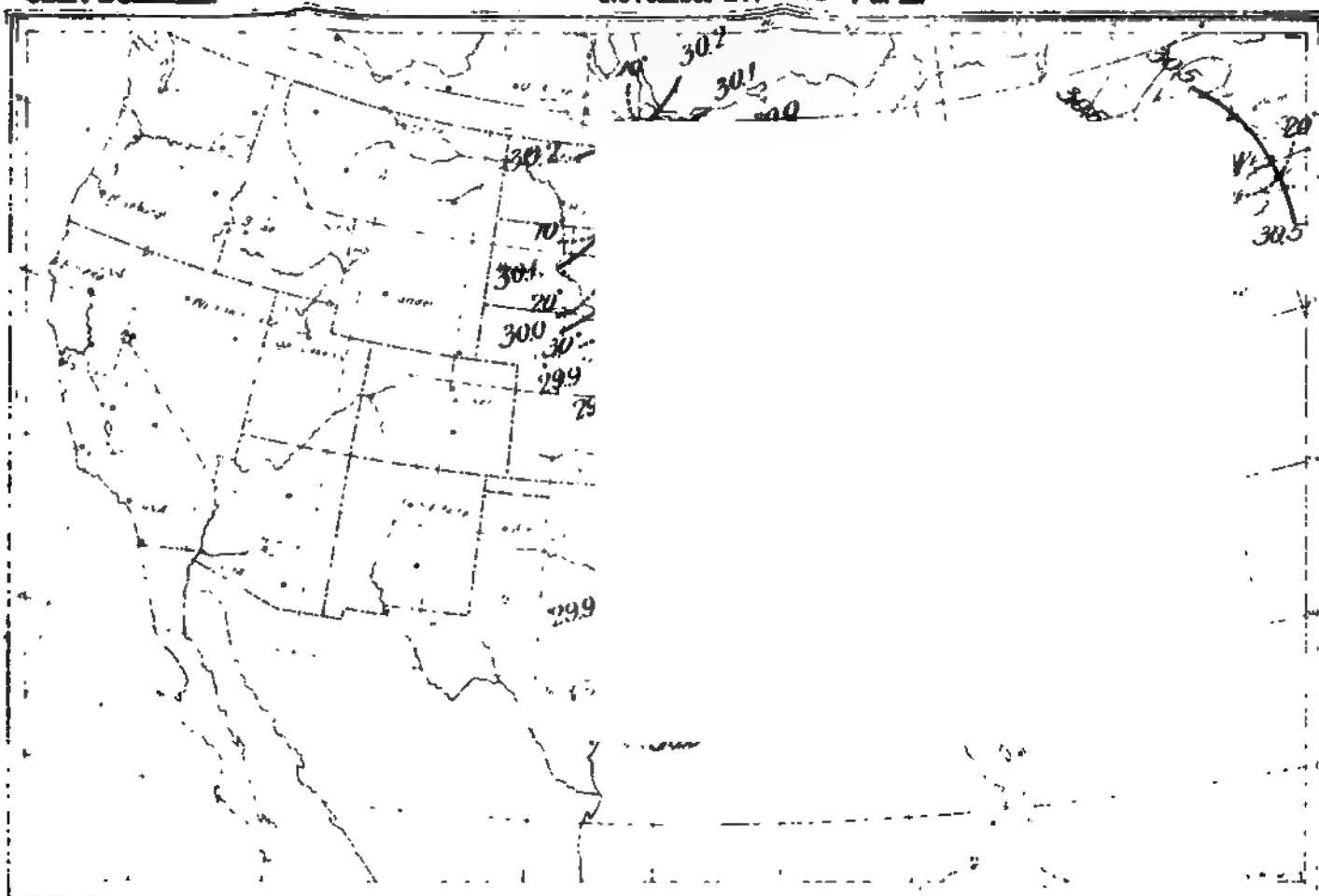


Chart DOLXXIV.

November 27, 1879—8 p. m.

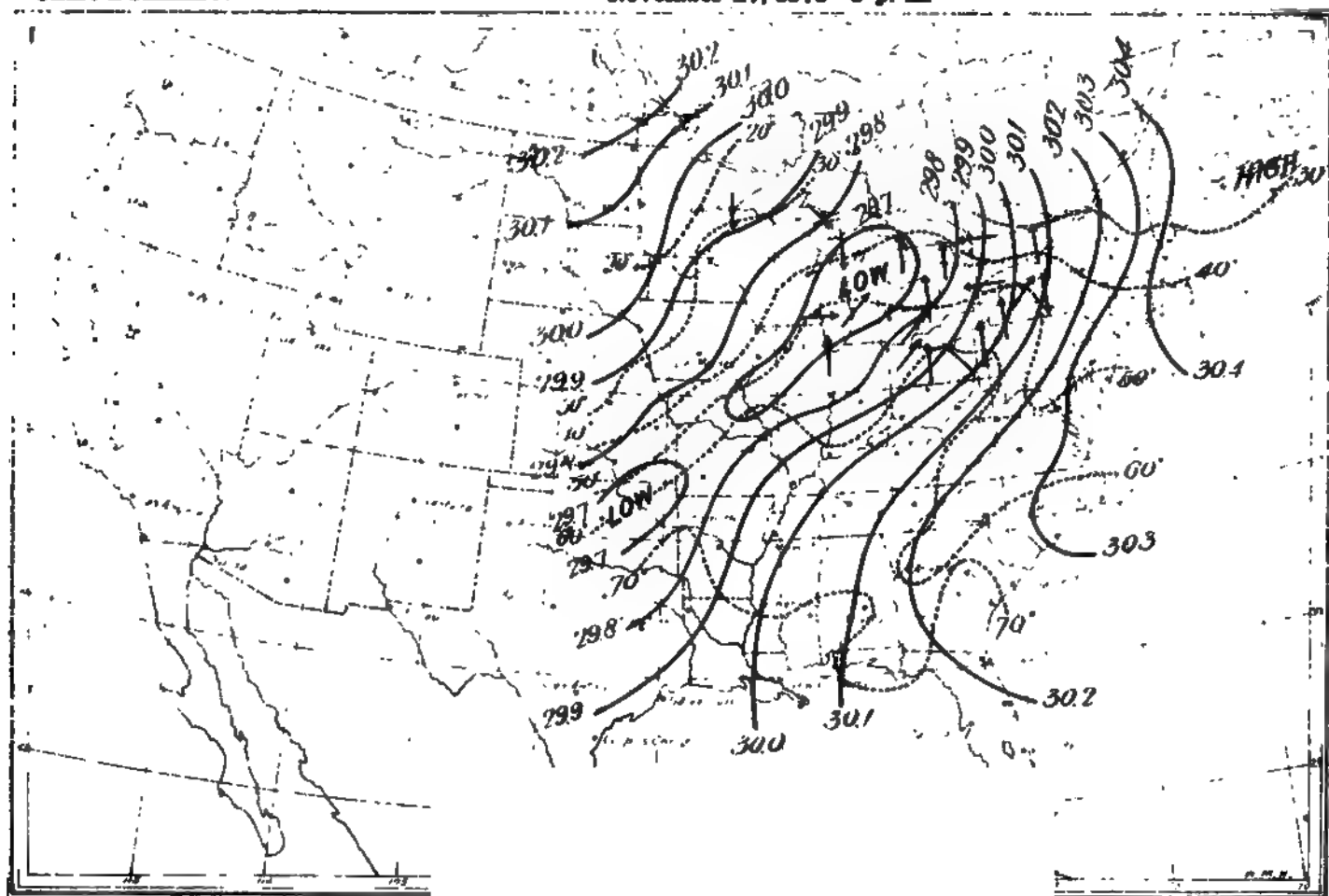


Chart DOLXXV.

November 28, 1879—7 a. m.

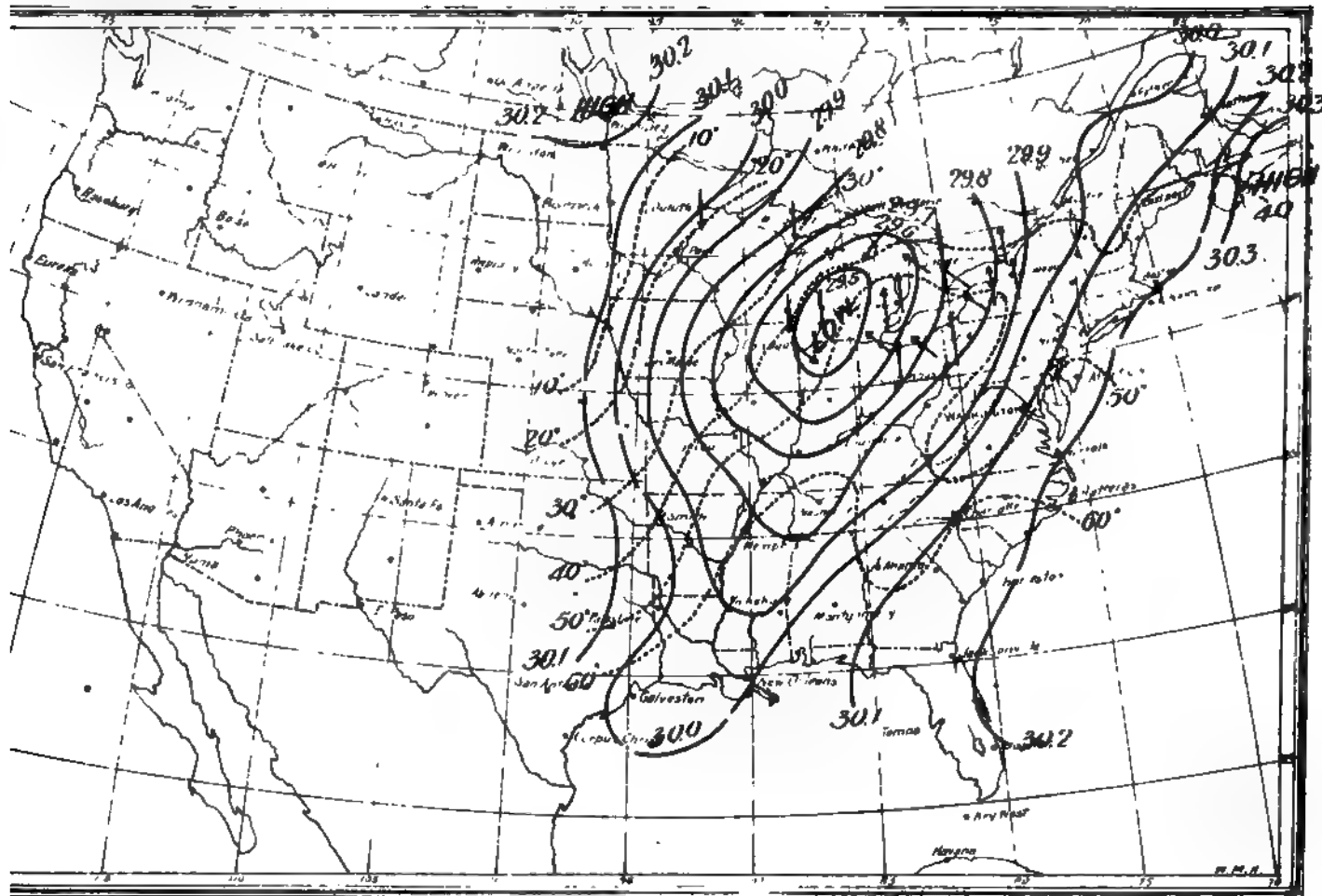


Chart DOLXXVI.

November 28, 1879—3 p. m.

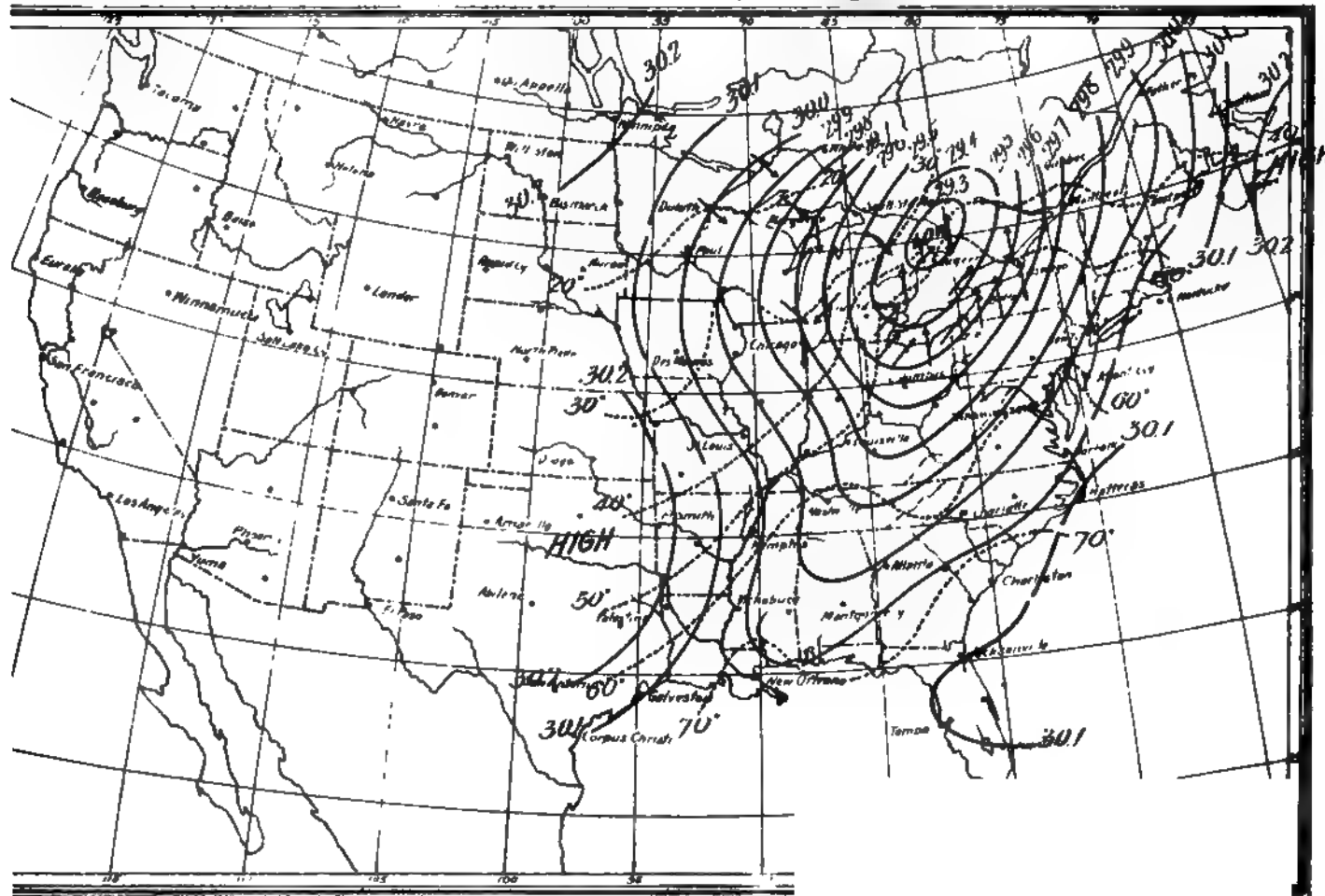


Chart DOLXXXVII.

November 5, 1880—3 p. m.

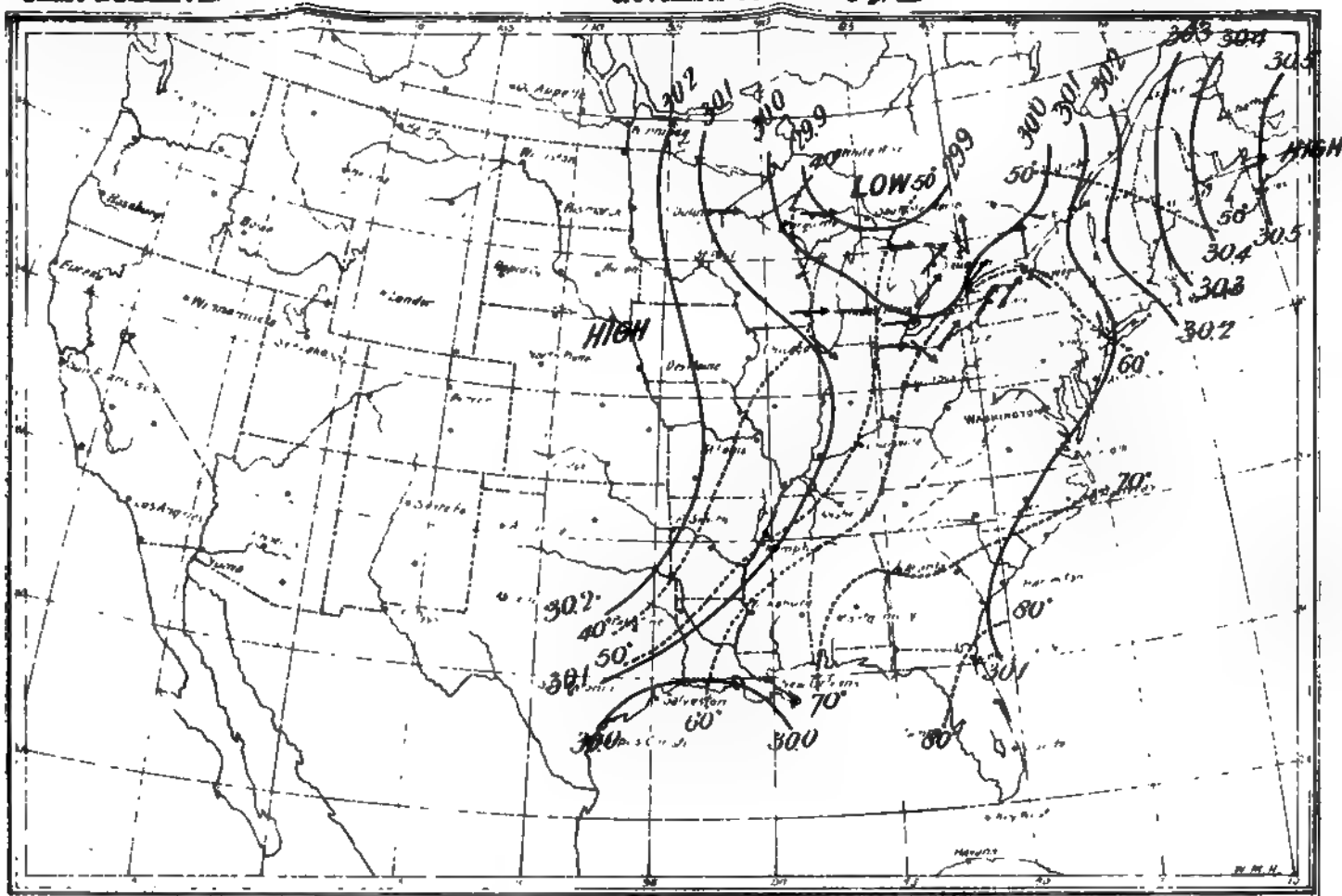


Chart DOLXXXVIII.

November 6, 1880—7 a. m.

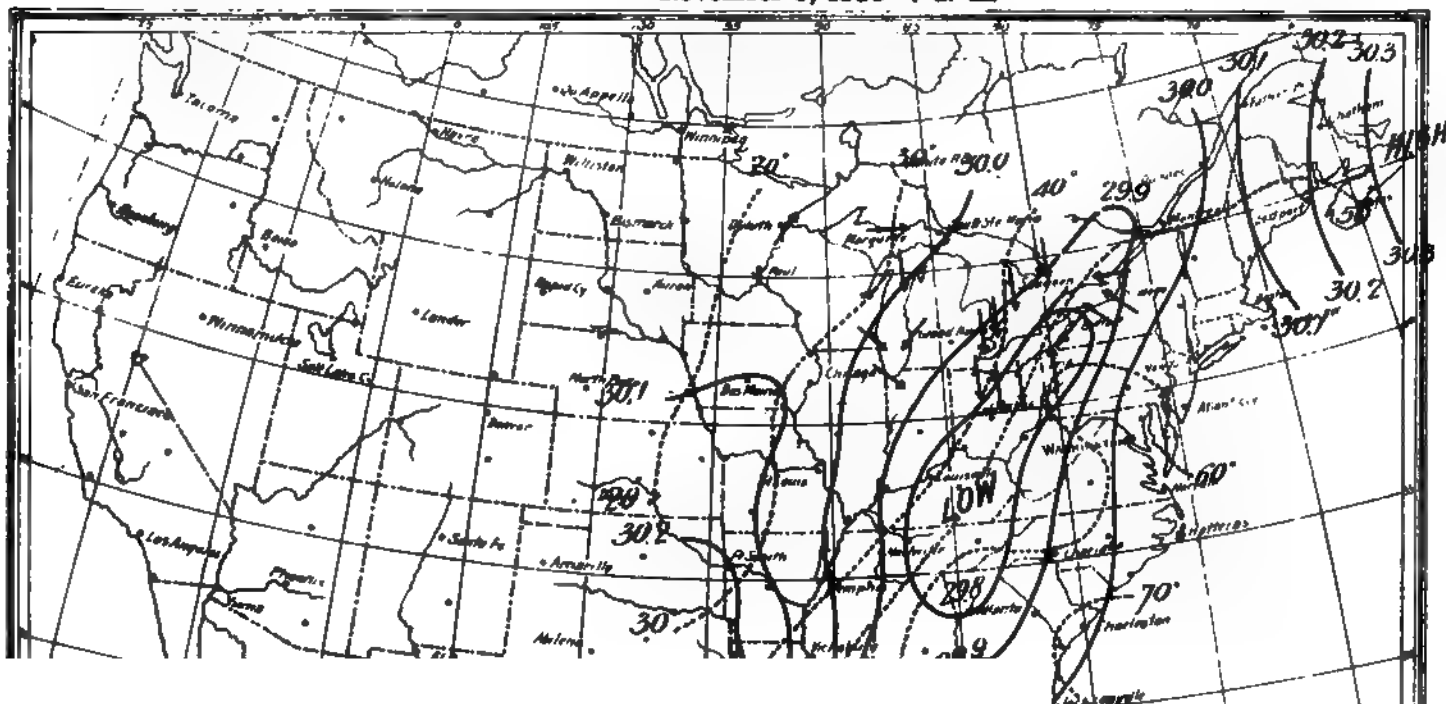
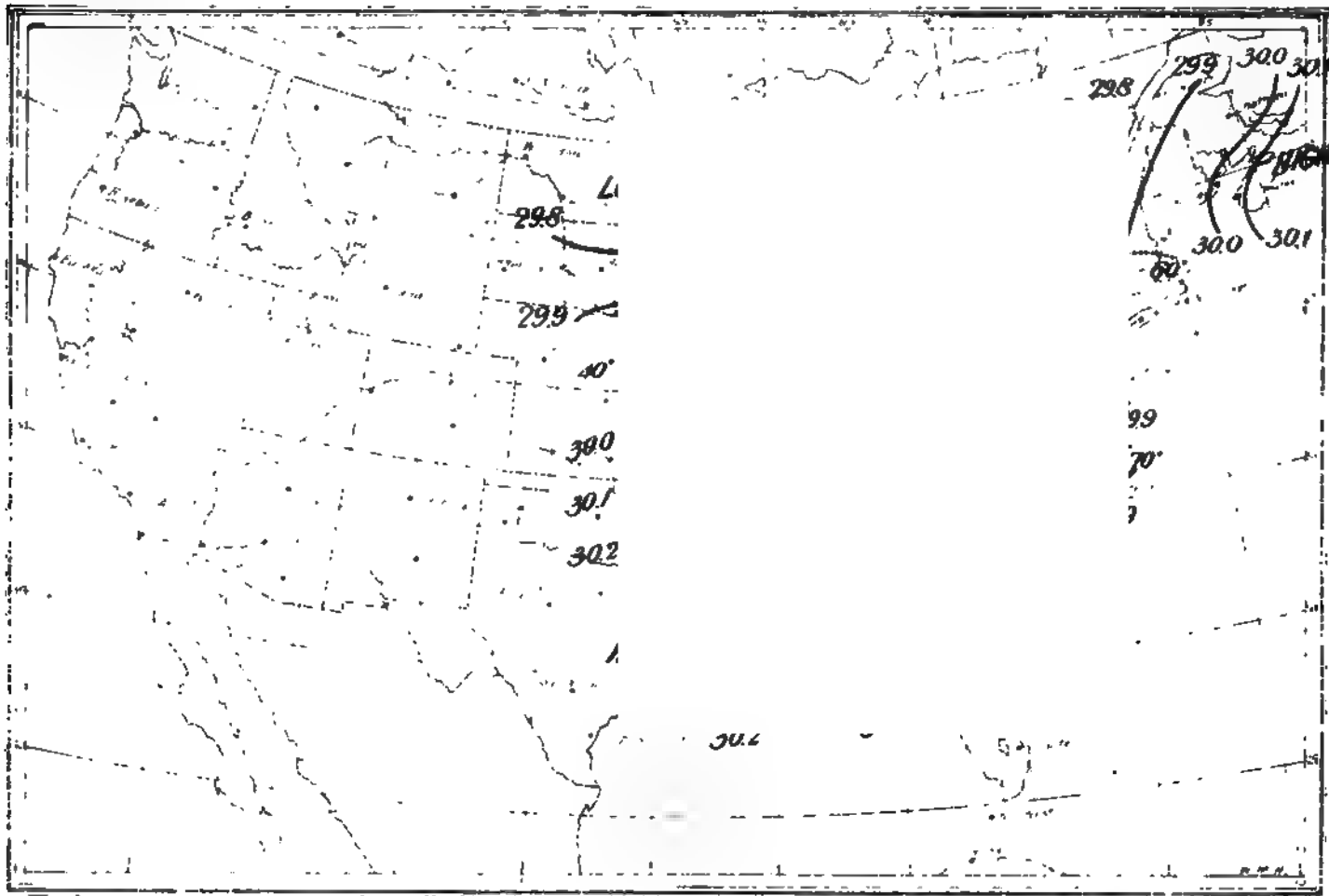


Chart DOLXXIX.

November 8, 1890--8 p. m.

**Chart DOLXXX.**

November 7, 1880—7 a. m.

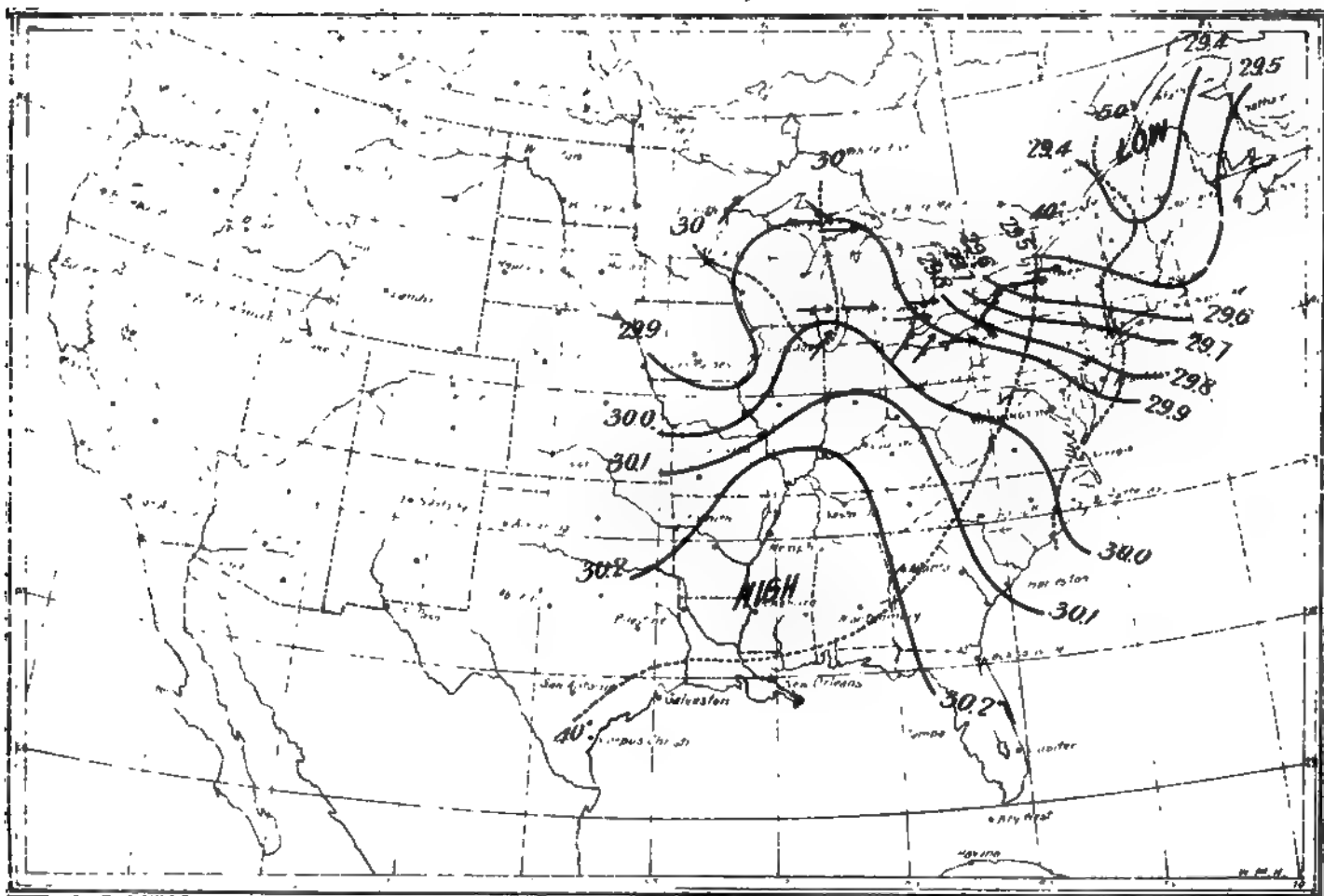


Chart DOLXXXI

November 19, 1880—7 a. m.

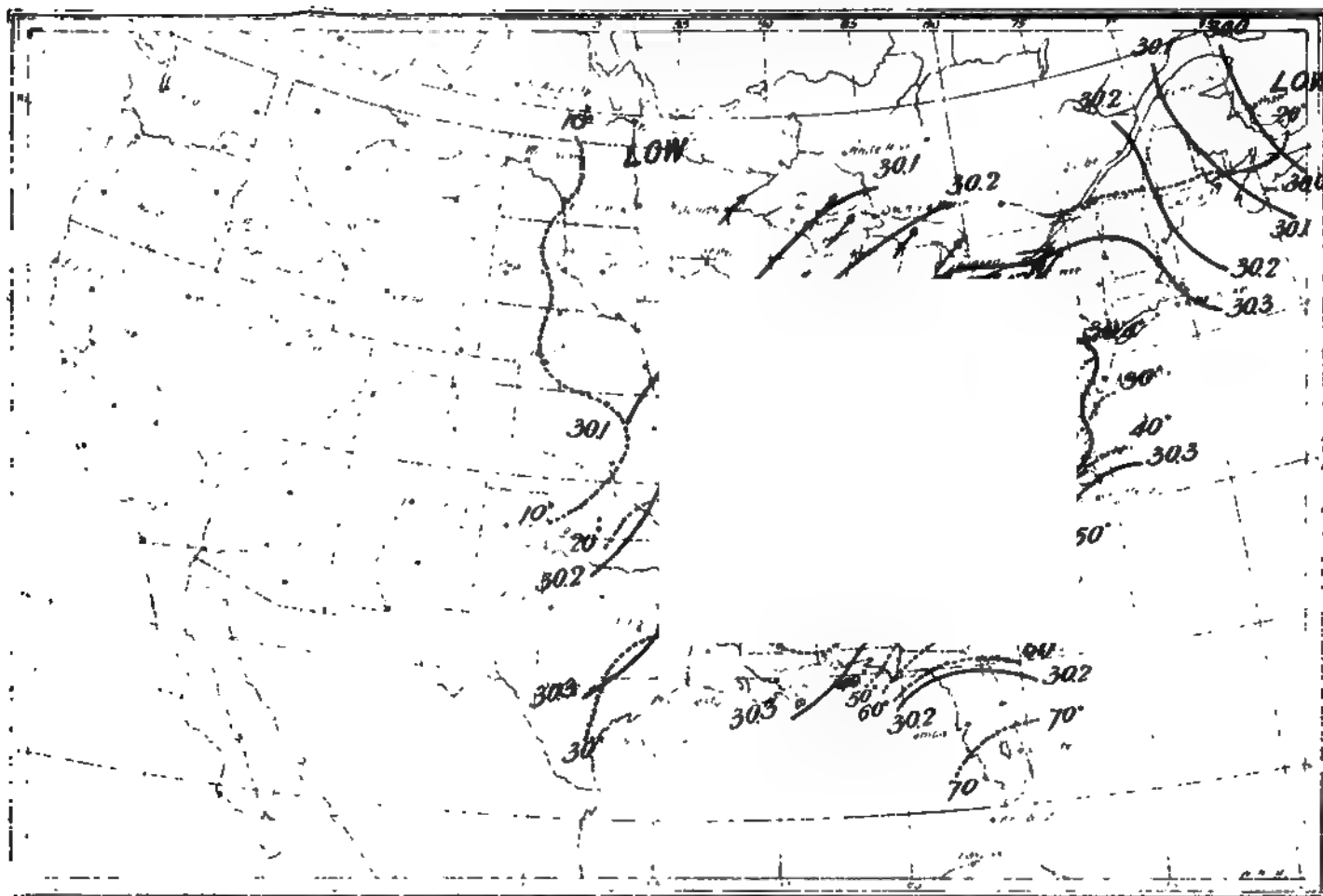


Chart DOLXXXII

November 19, 1880—3 p. m.

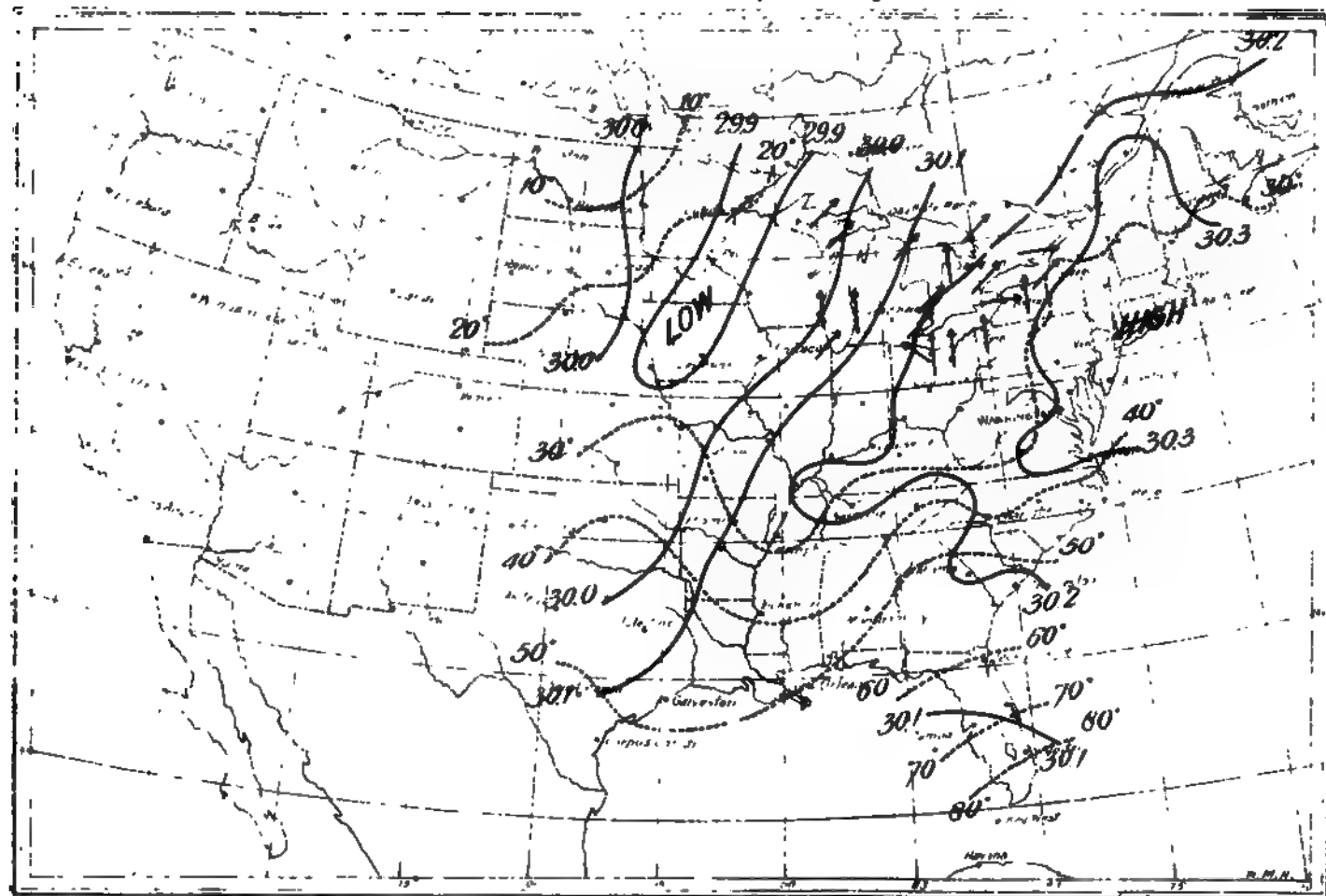


Chart DCLXXXIII.

November 20, 1880—7 a. m.

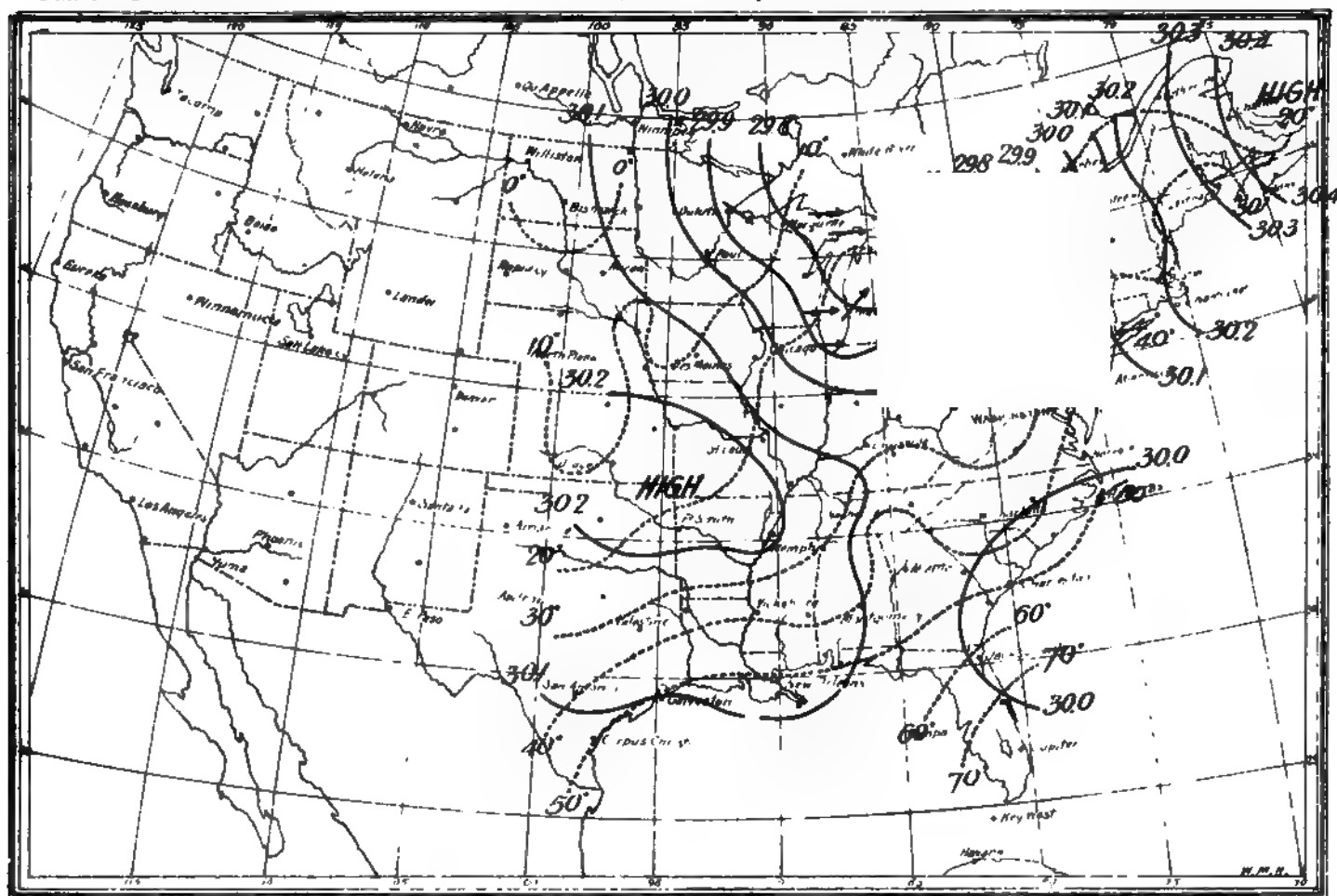


Chart DCLXXXIV.

November 20, 1880—8 p. m.

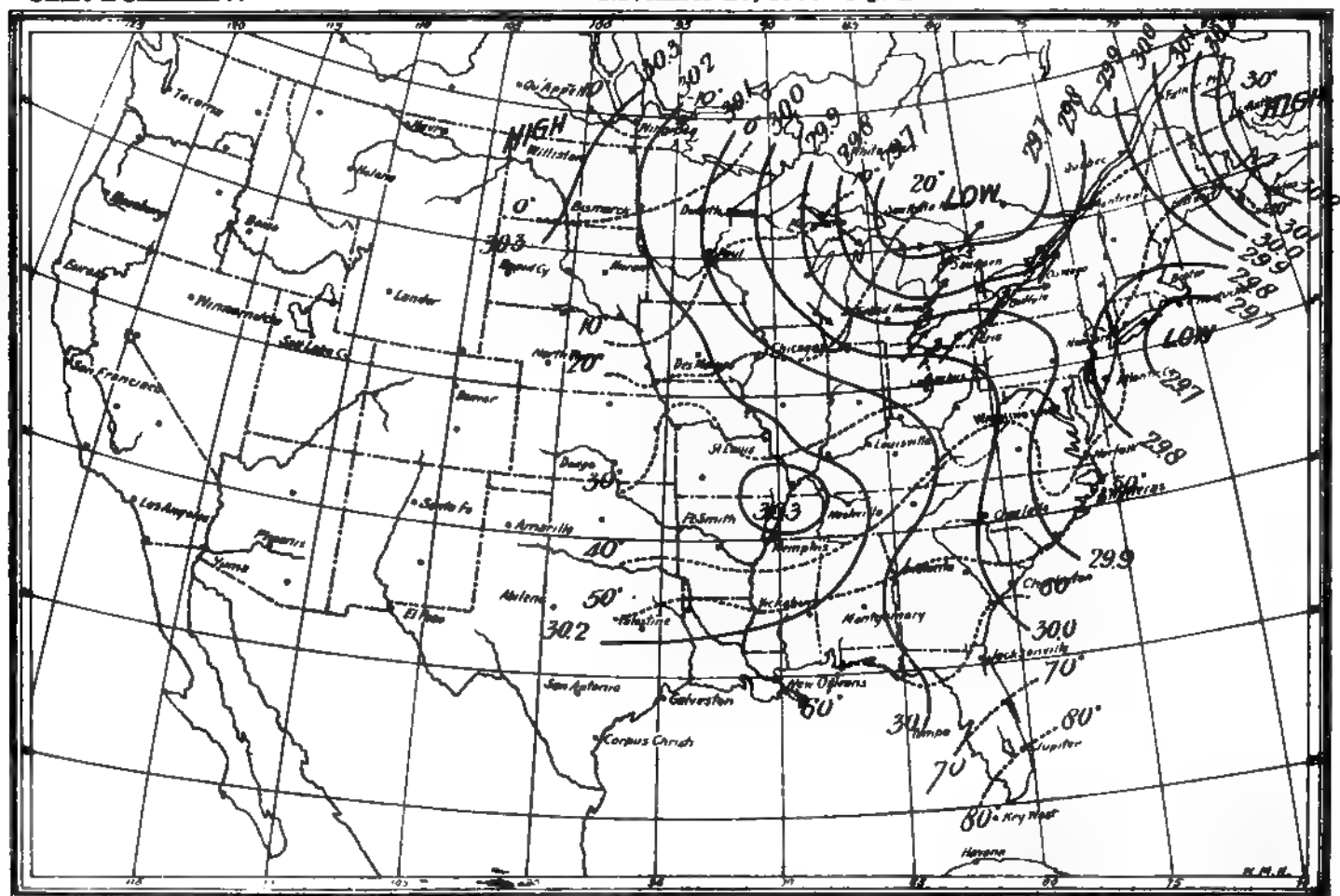


Chart DOLXXXV.

November 11, 1881—7 a. m.

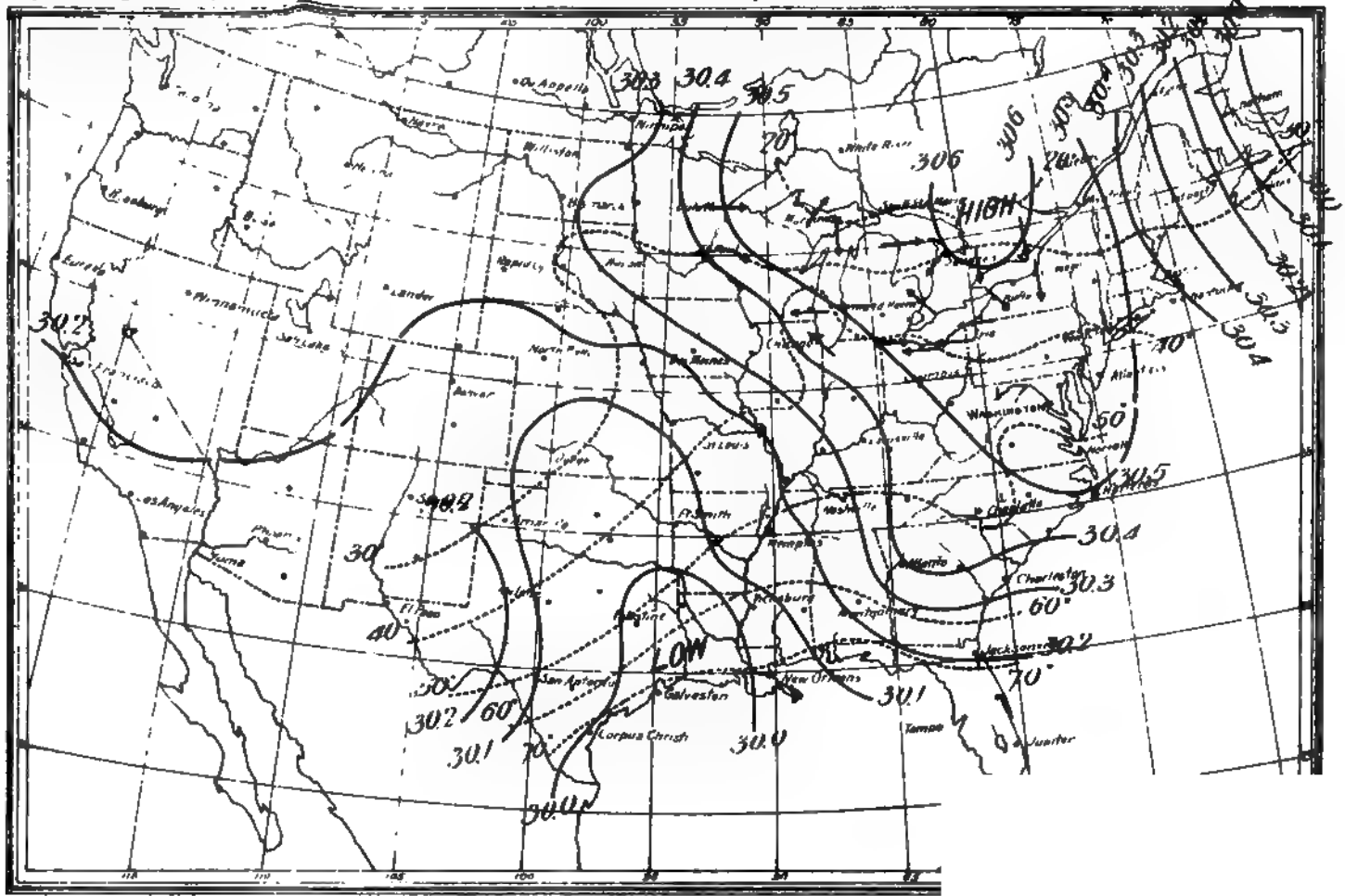


Chart DOLXXXVI.

November 11, 1881—3 p. m.

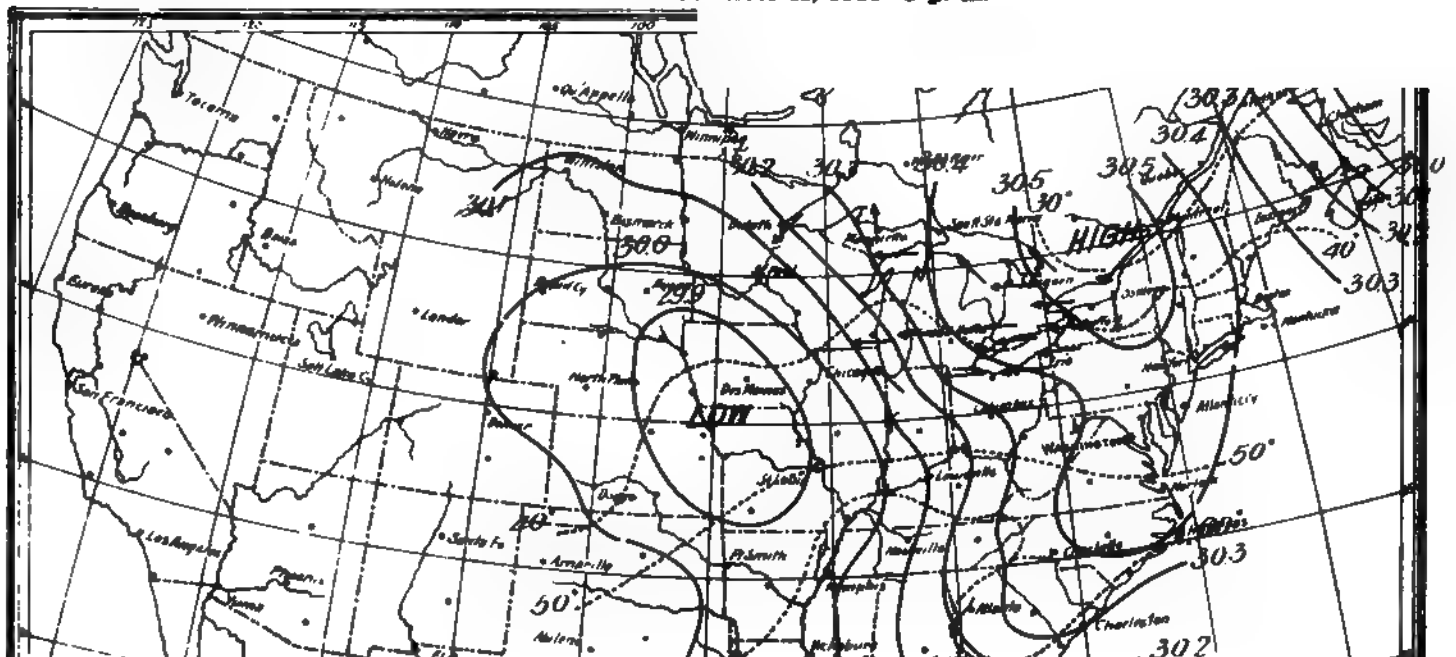


Chart DOLXXVII.

November 12, 1881—7 a. m.

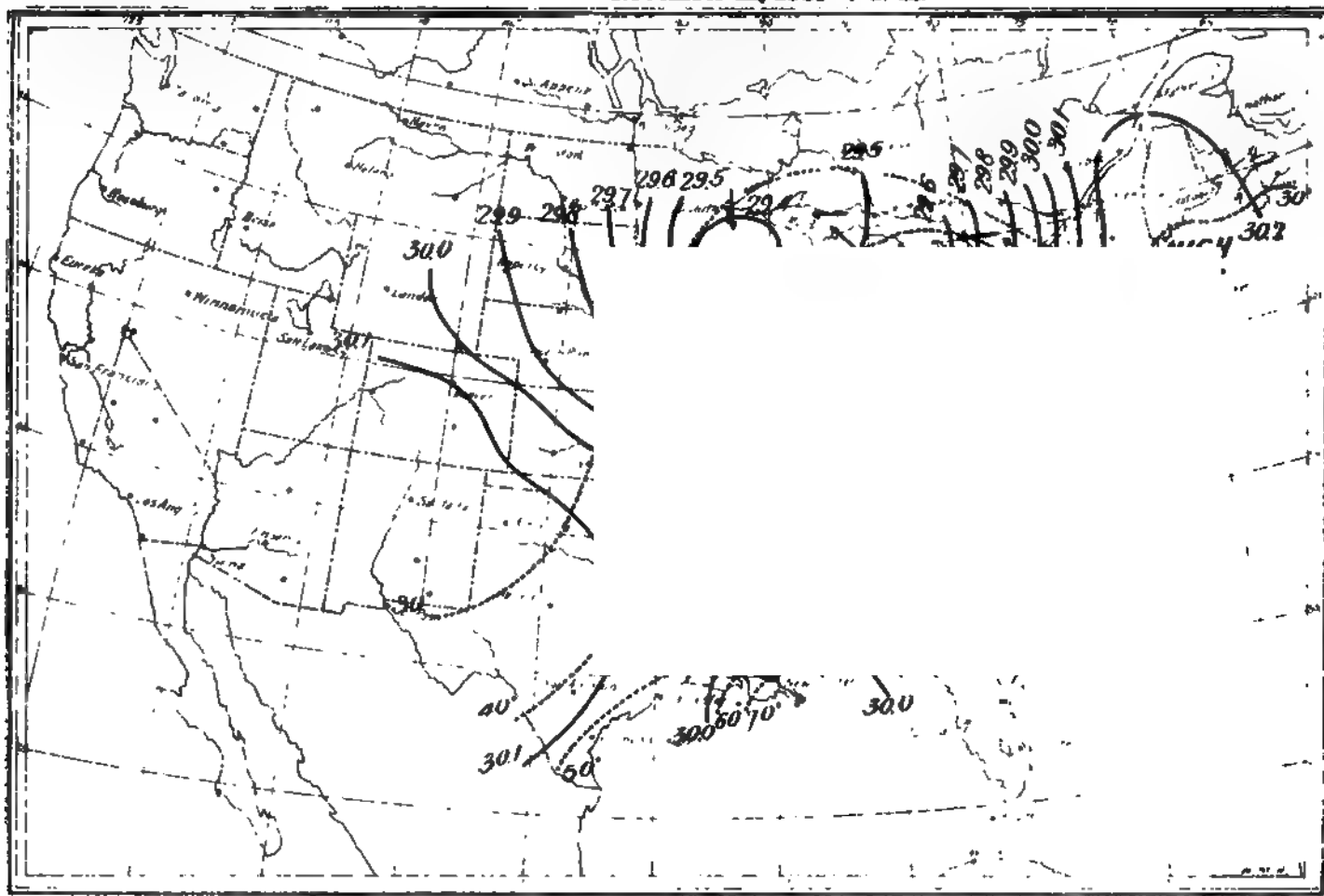


Chart DOLXXXVIII.

November 12, 1881—3 p. m.

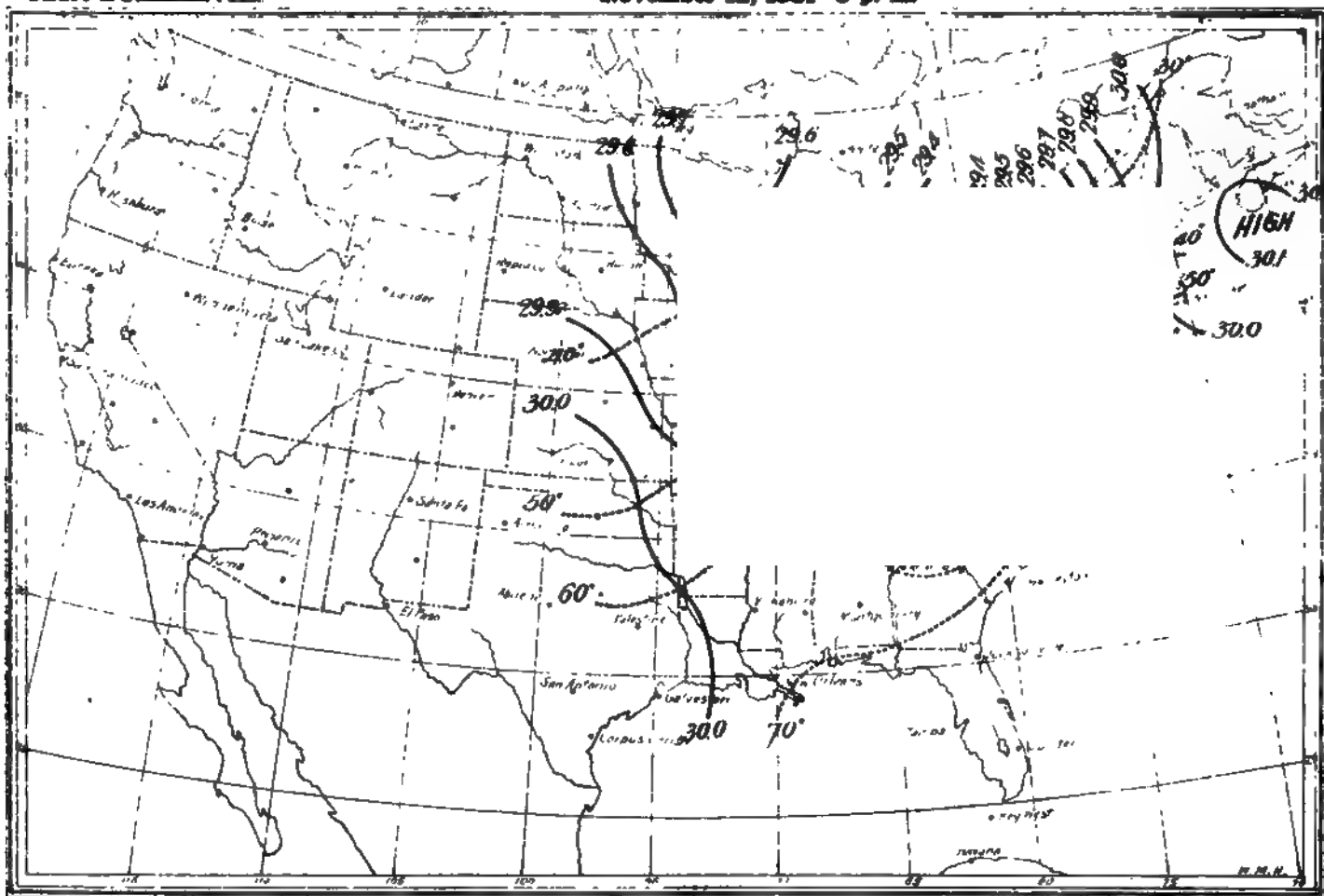


Chart DOLXXXIX.

November 18, 1881—7 a. m.

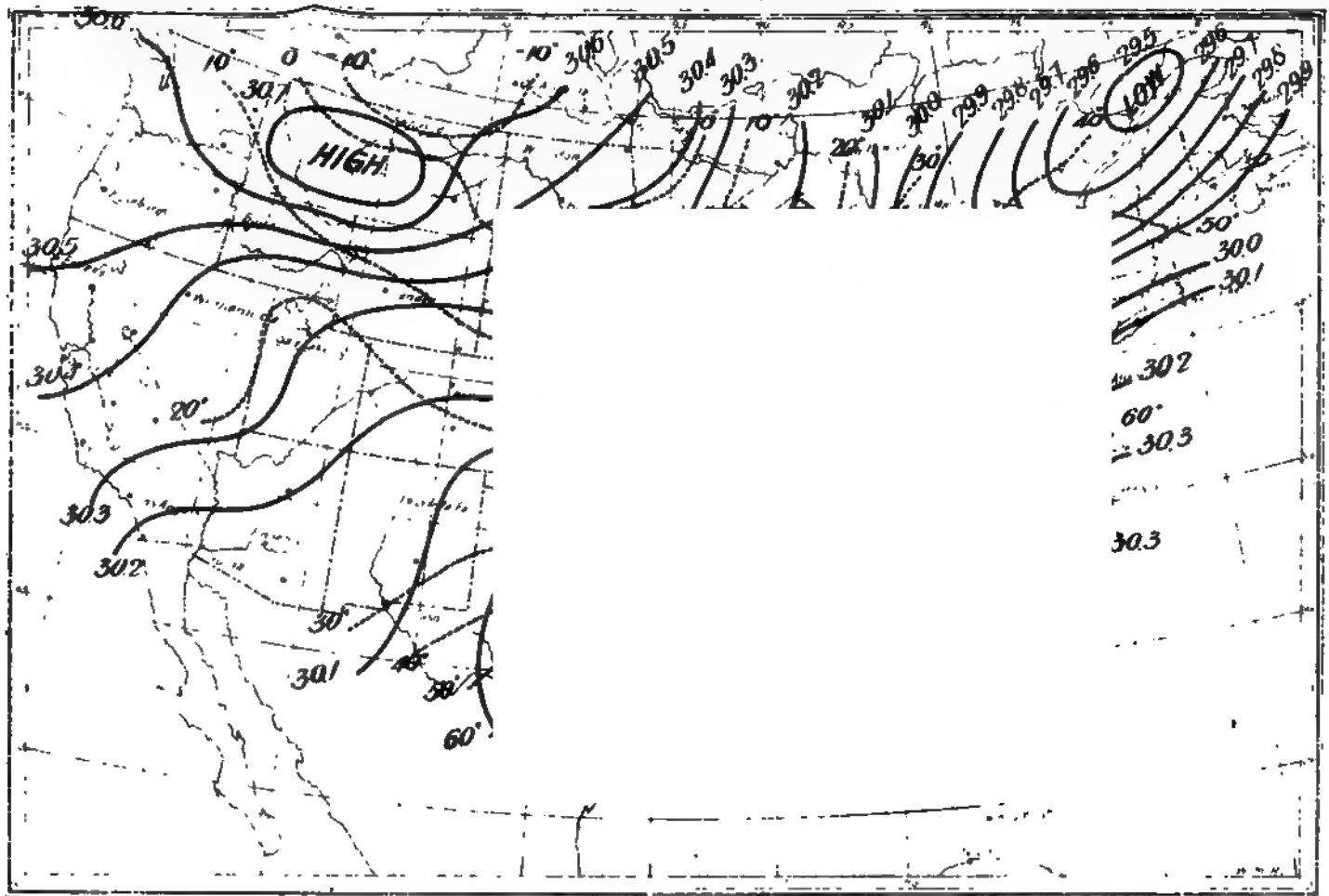


Chart DOXO.

November 18, 1881—8 p. m.

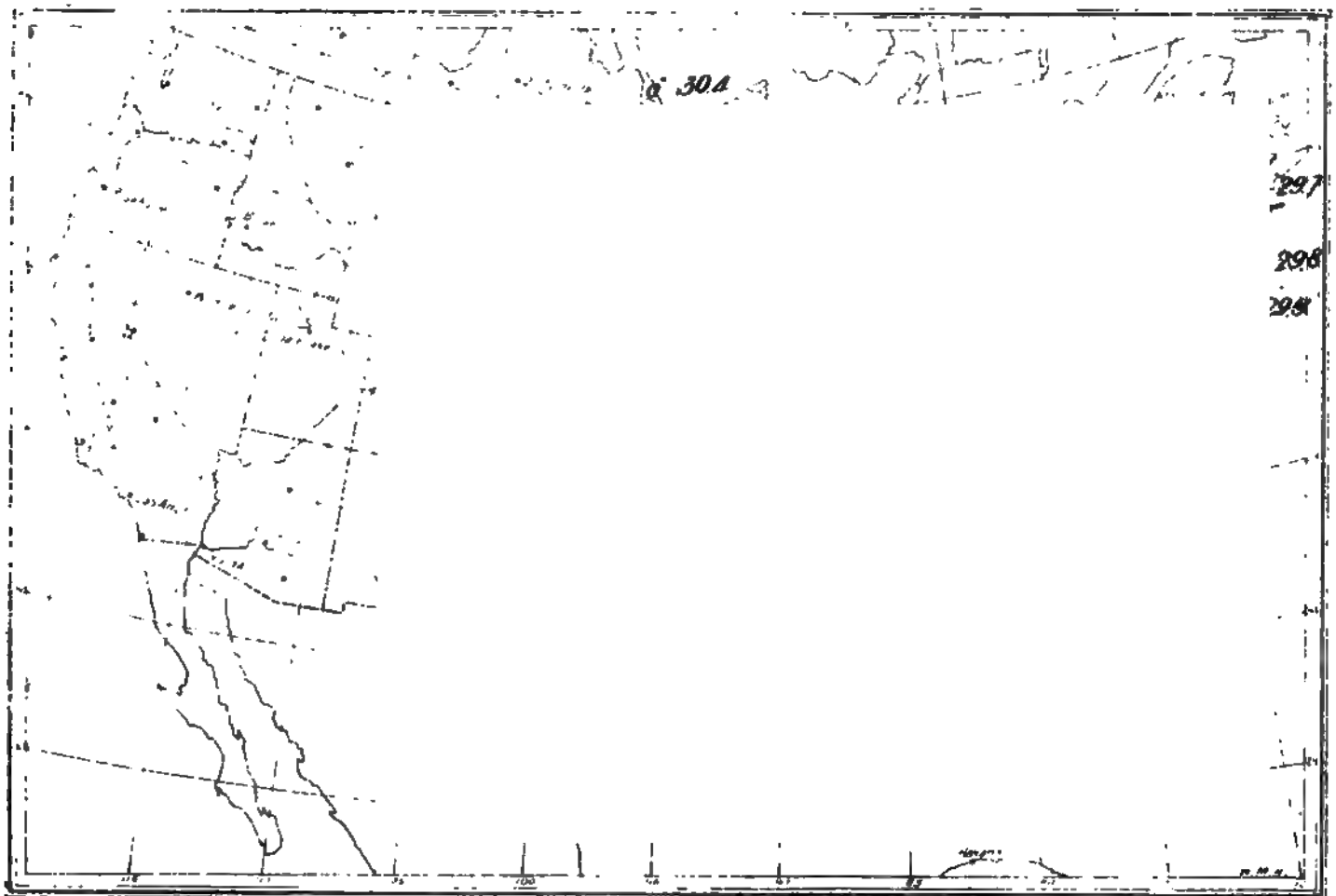


Chart DOKOL

November 19, 1881—7 a. m.

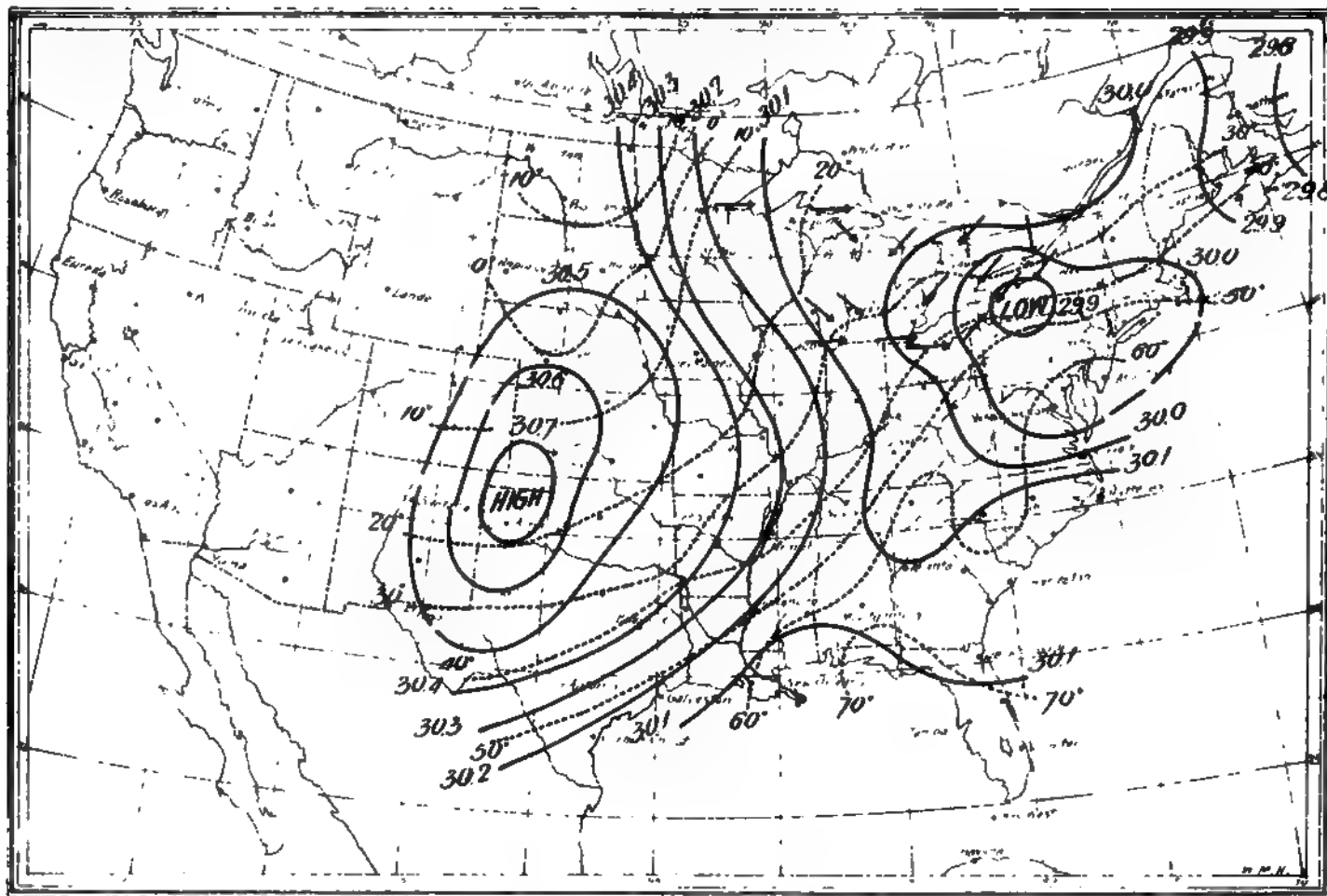
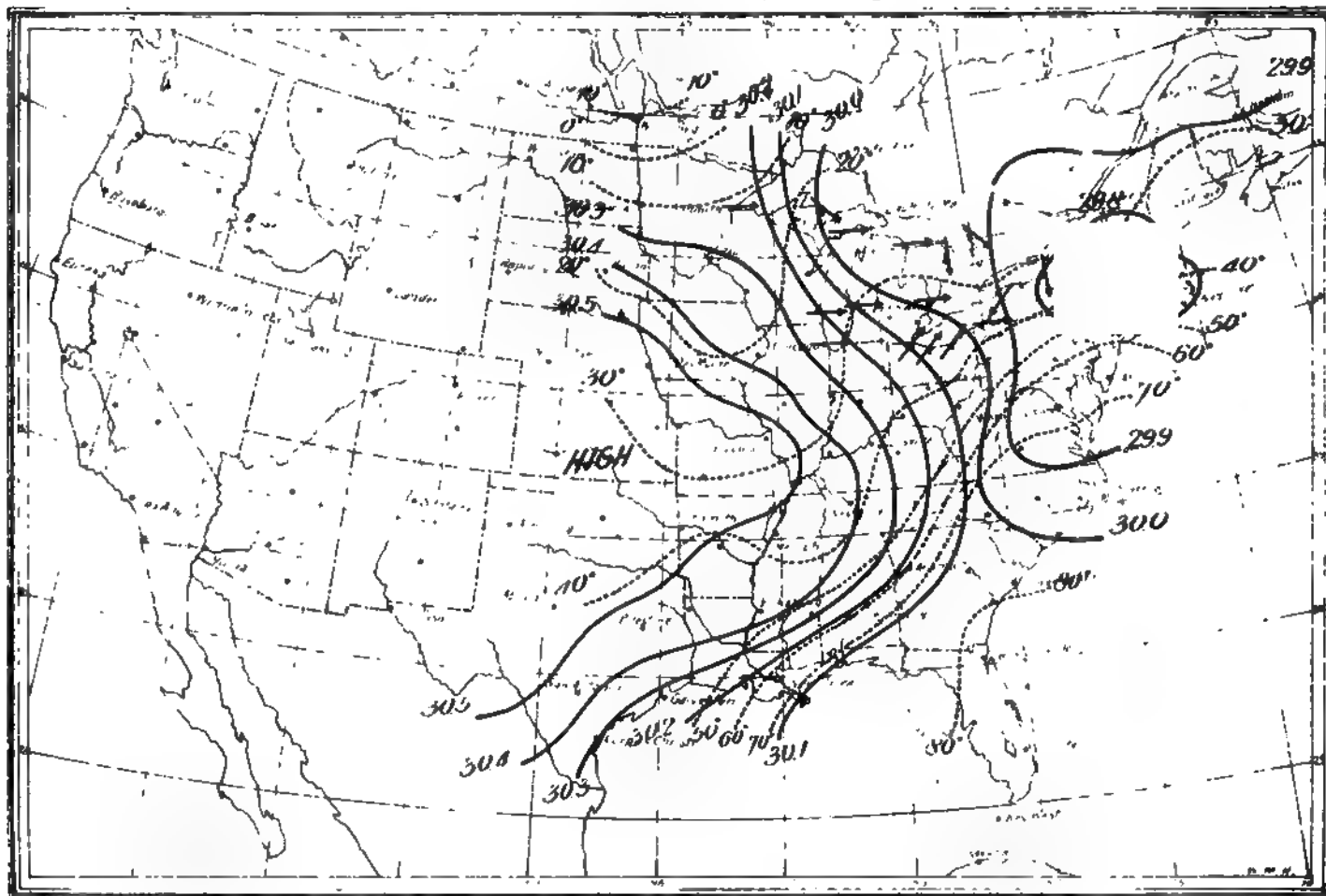


Chart DOKOL

November 19, 1881—3 p. m.



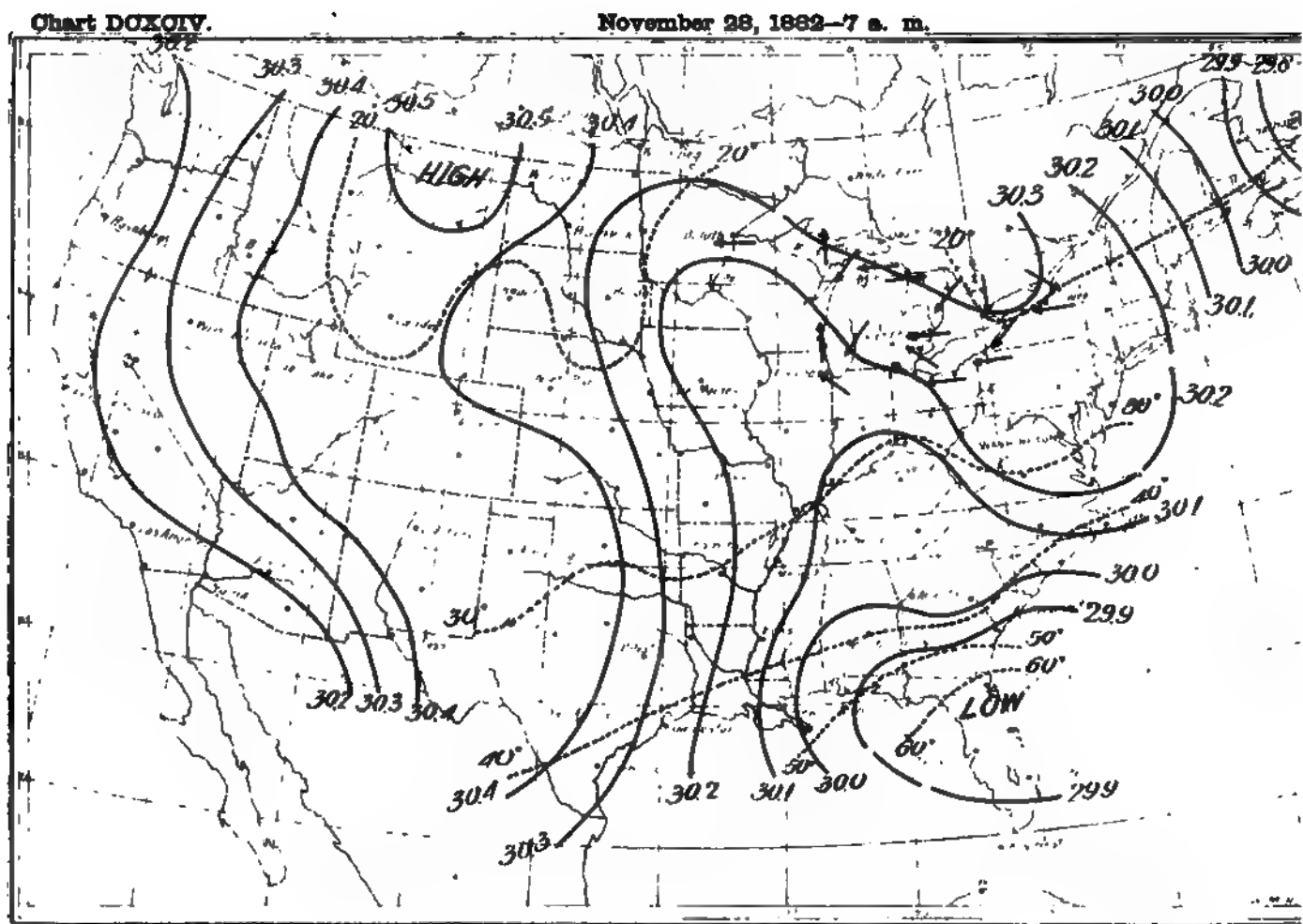


Chart DOXOV.

November 28, 1882—8 p. m.

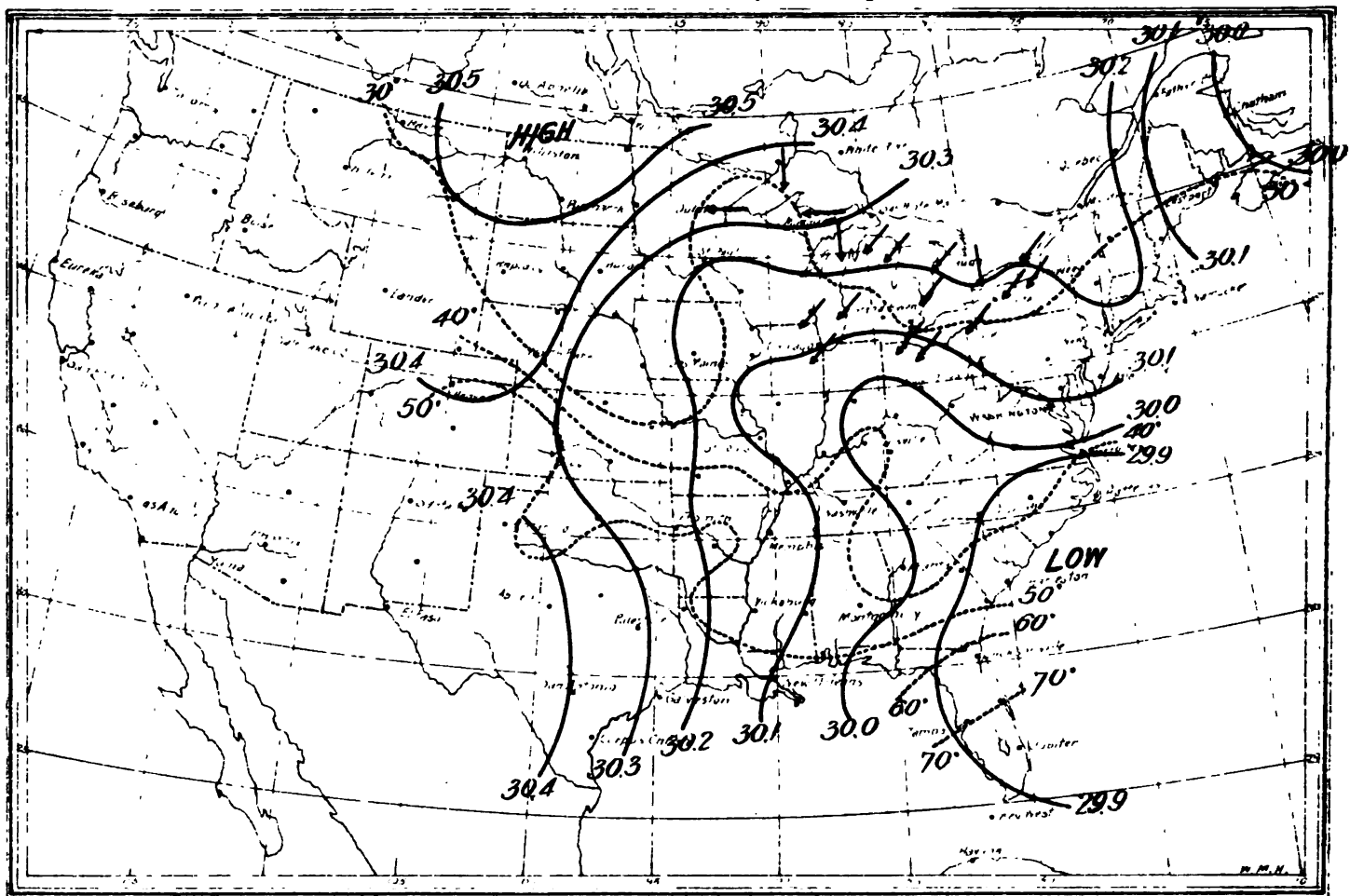


Chart DOXOVI.

November 29, 1882—7 a. m.

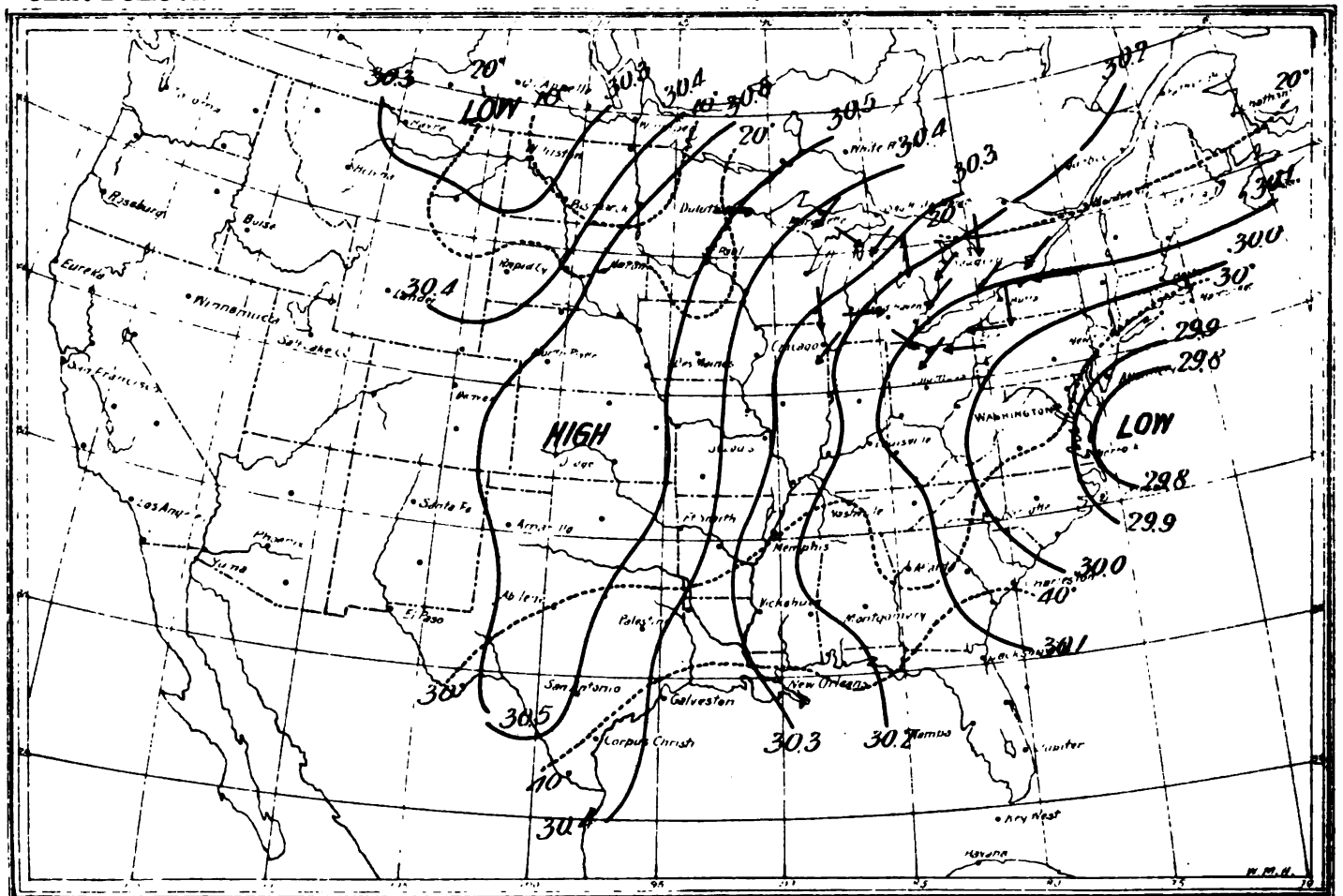


Chart DOXOVII.

November 10, 1888—7 a. m.

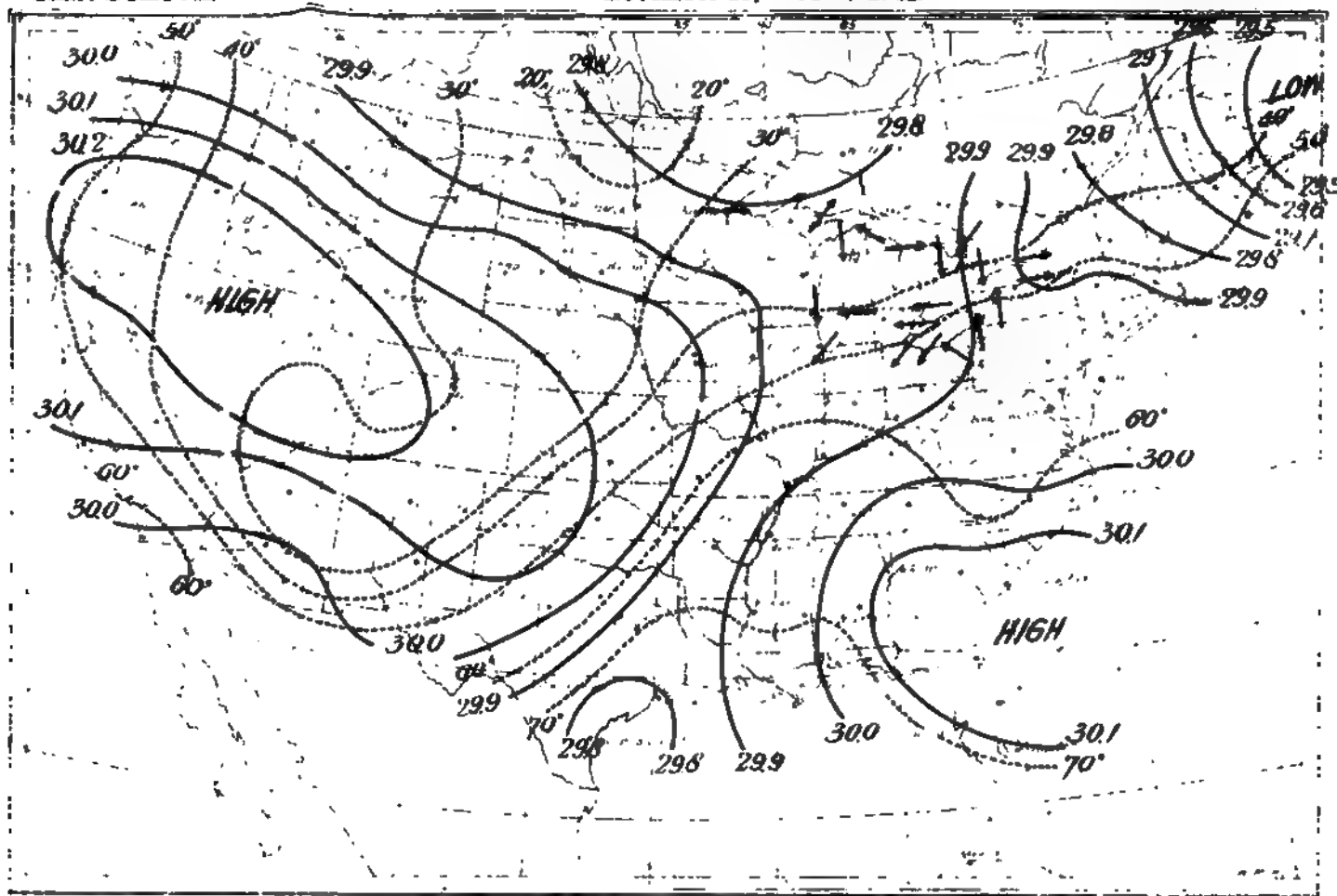


Chart DOXOVIII.

November 10, 1888—3 p. m.

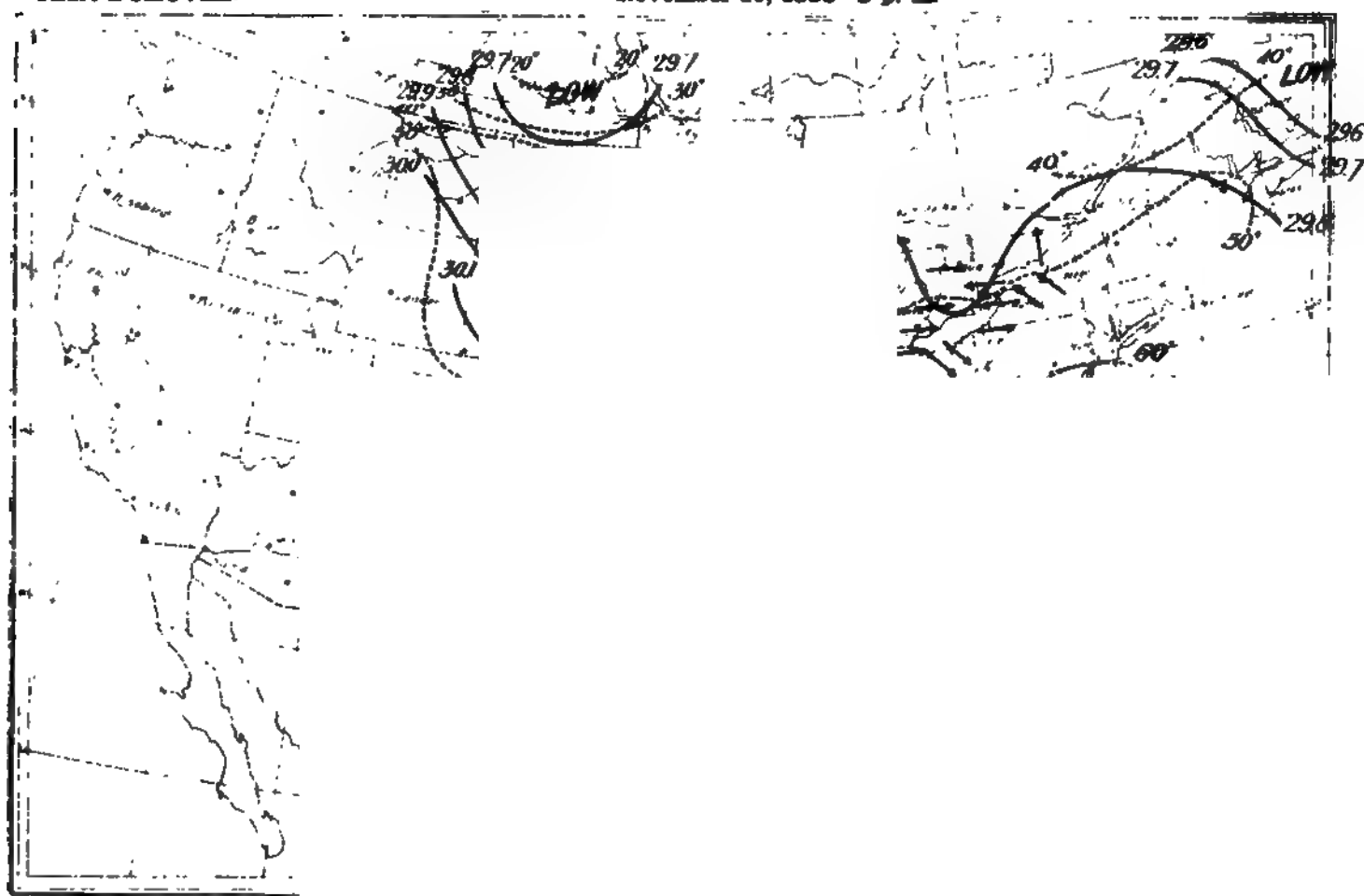


Chart DXXIX.

November 11, 1888—7 a. m.

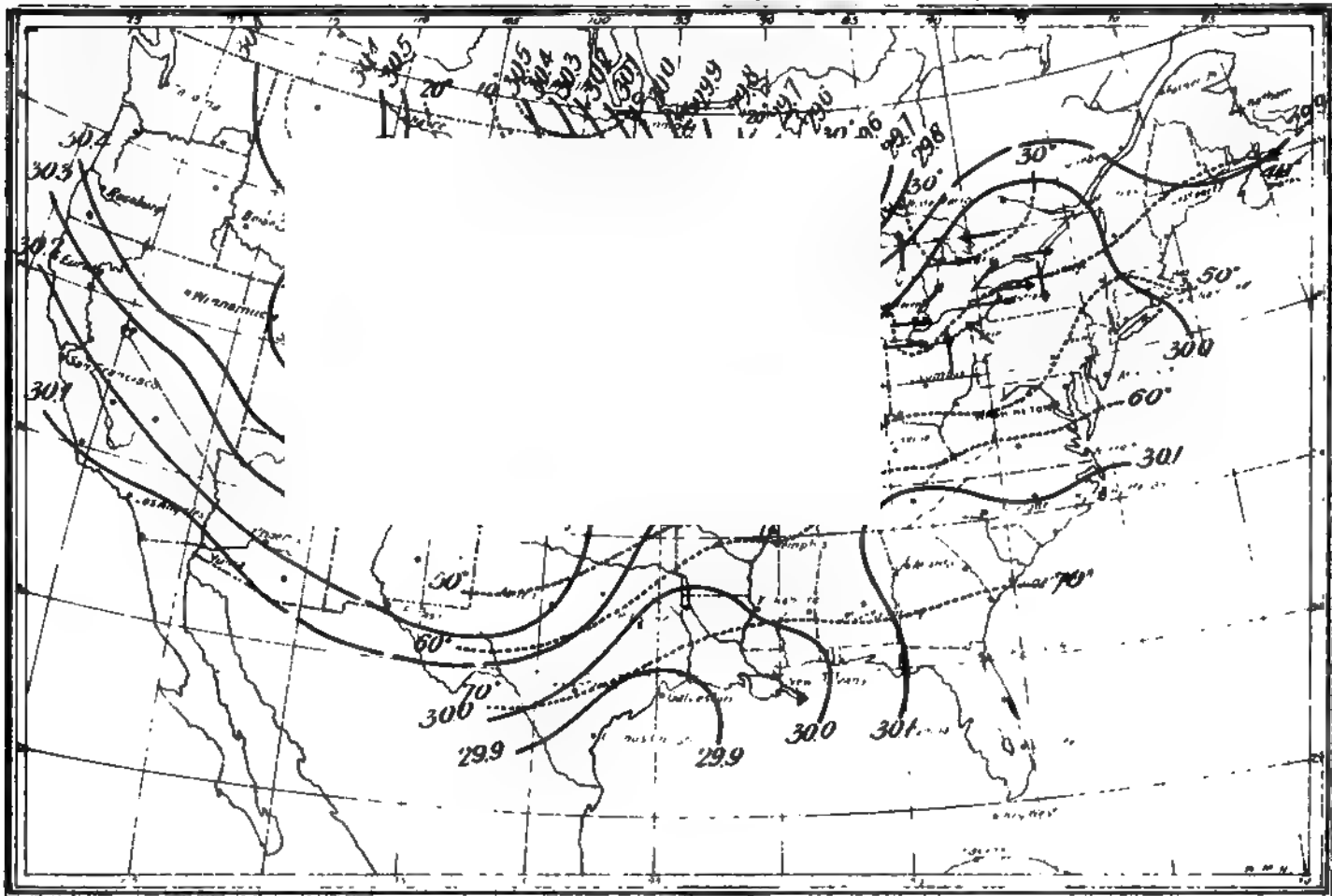


Chart DXX.

November 11, 1888—3 p. m.

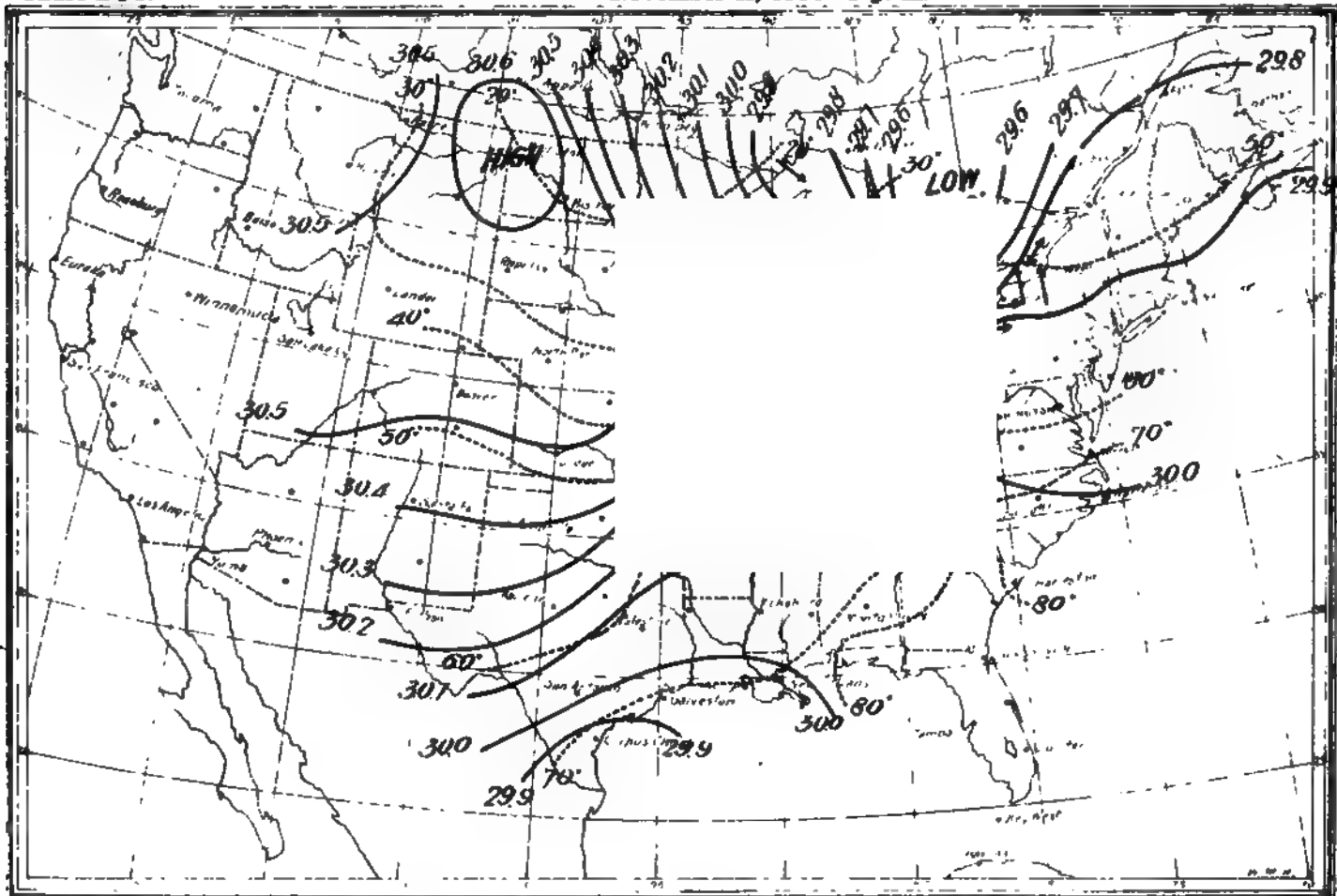


Chart DOOL

November 25, 1888—7 a. m.

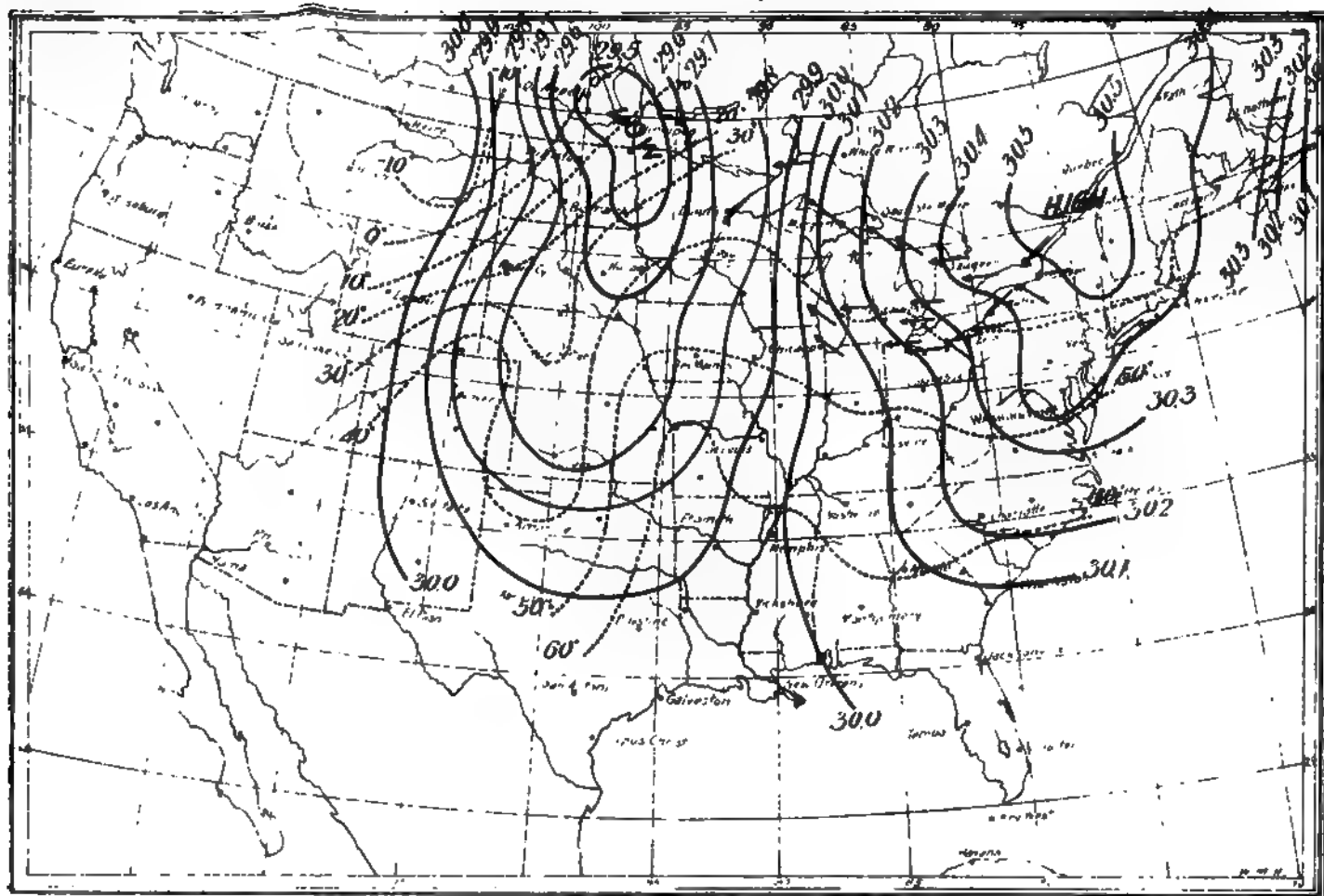


Chart DOOL

November 25, 1888—3 p. m.

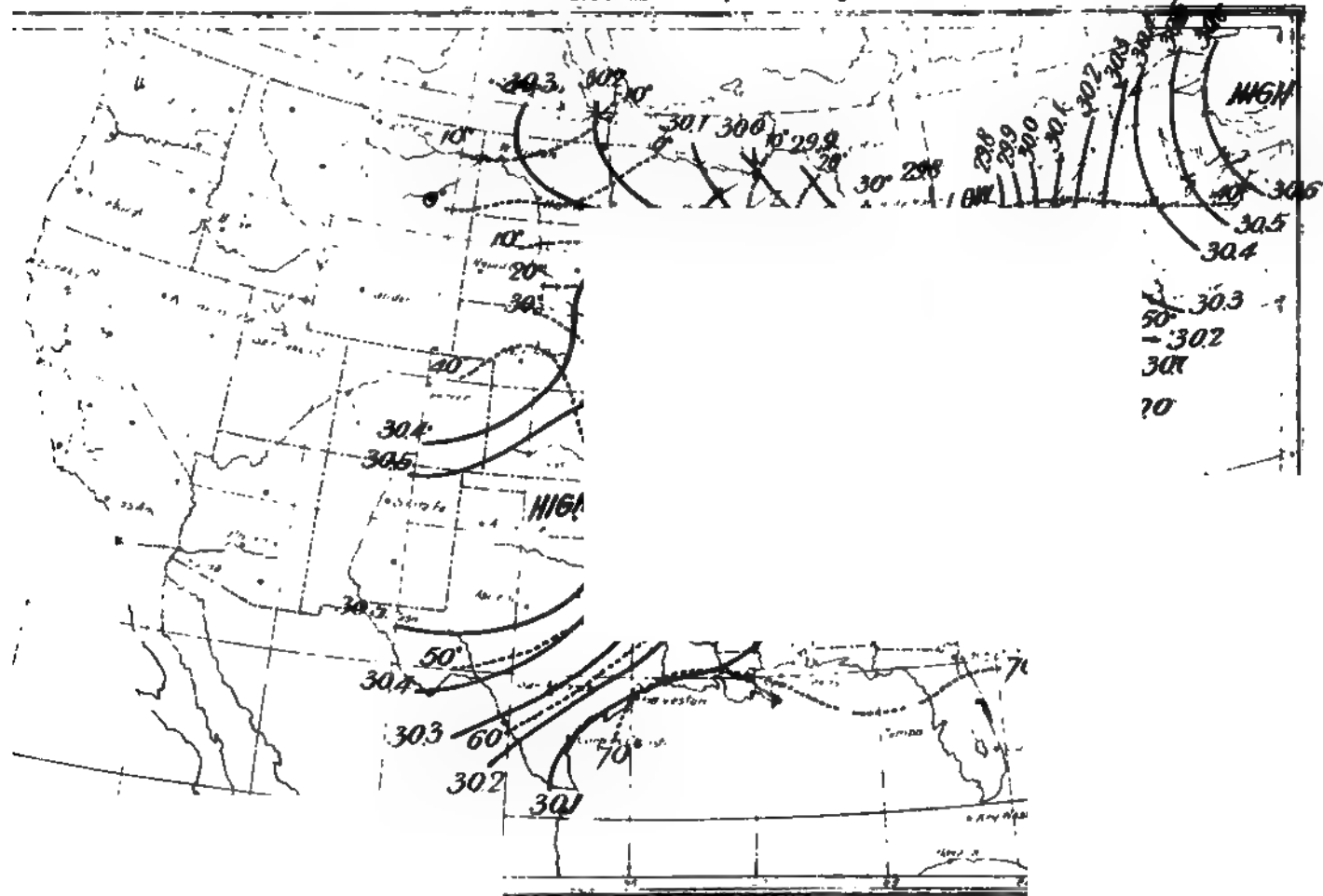
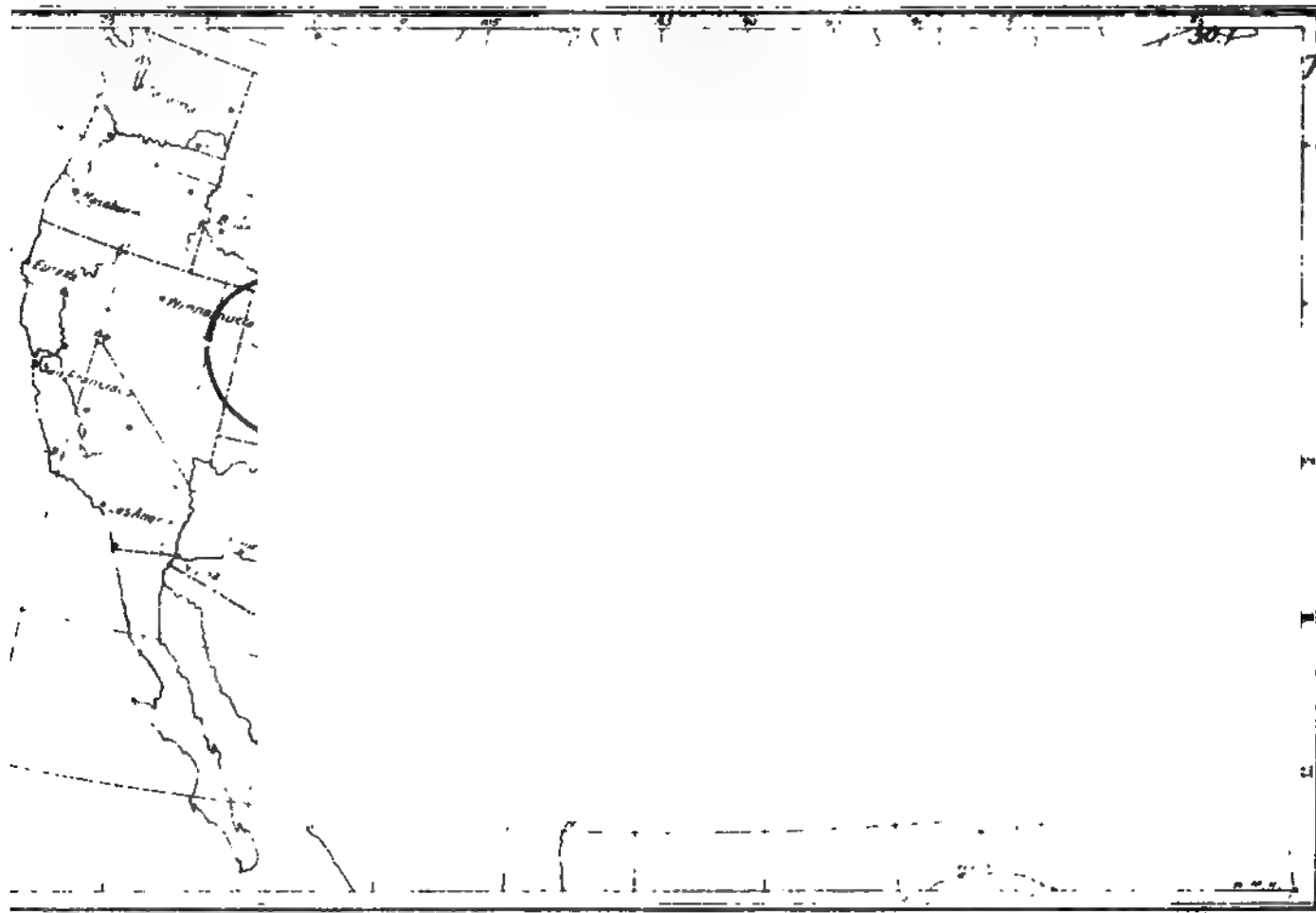


Chart DOOV.

November 8, 1884—7 a. m.

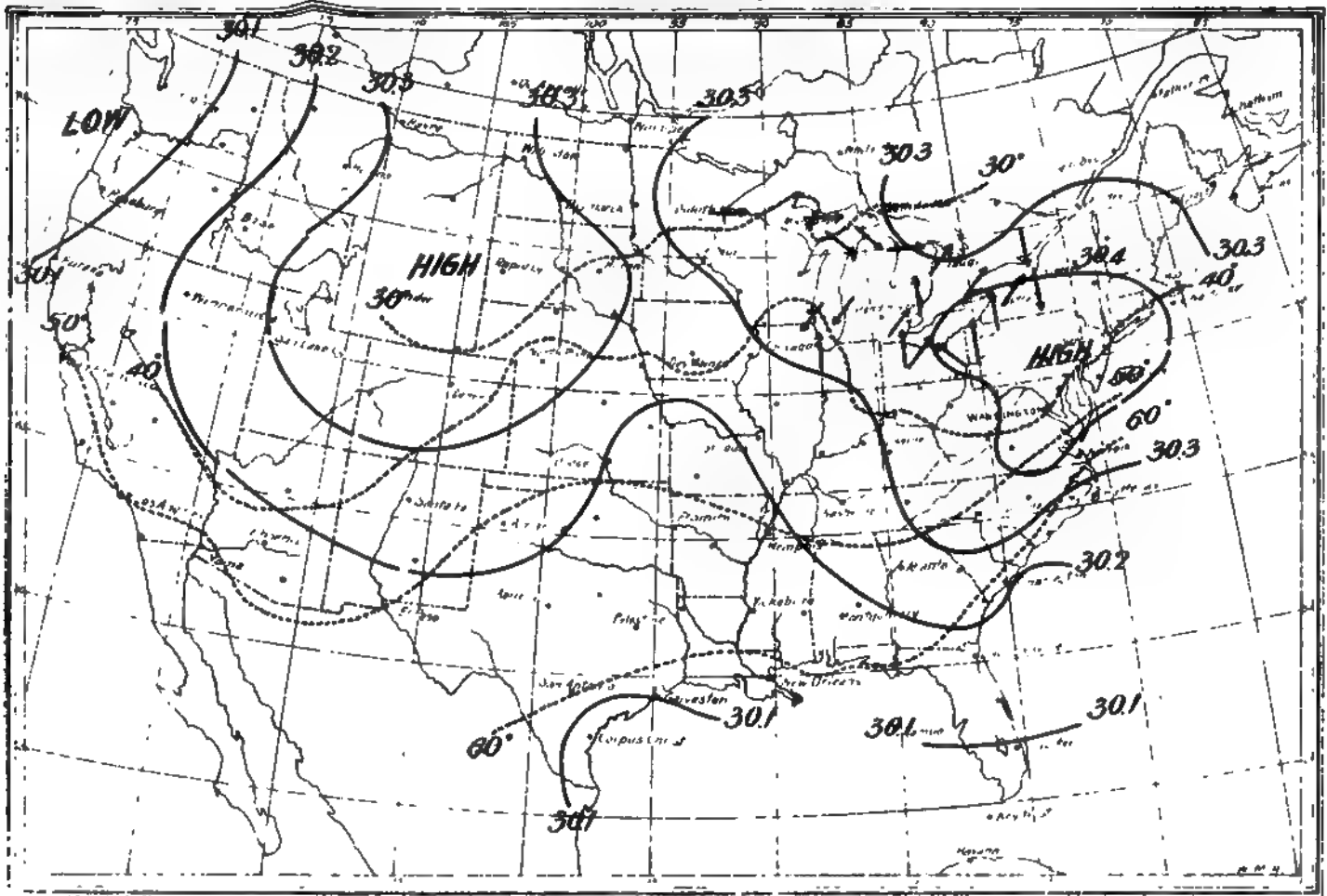


Chart DOOVL

November 8, 1884—8 p. m.

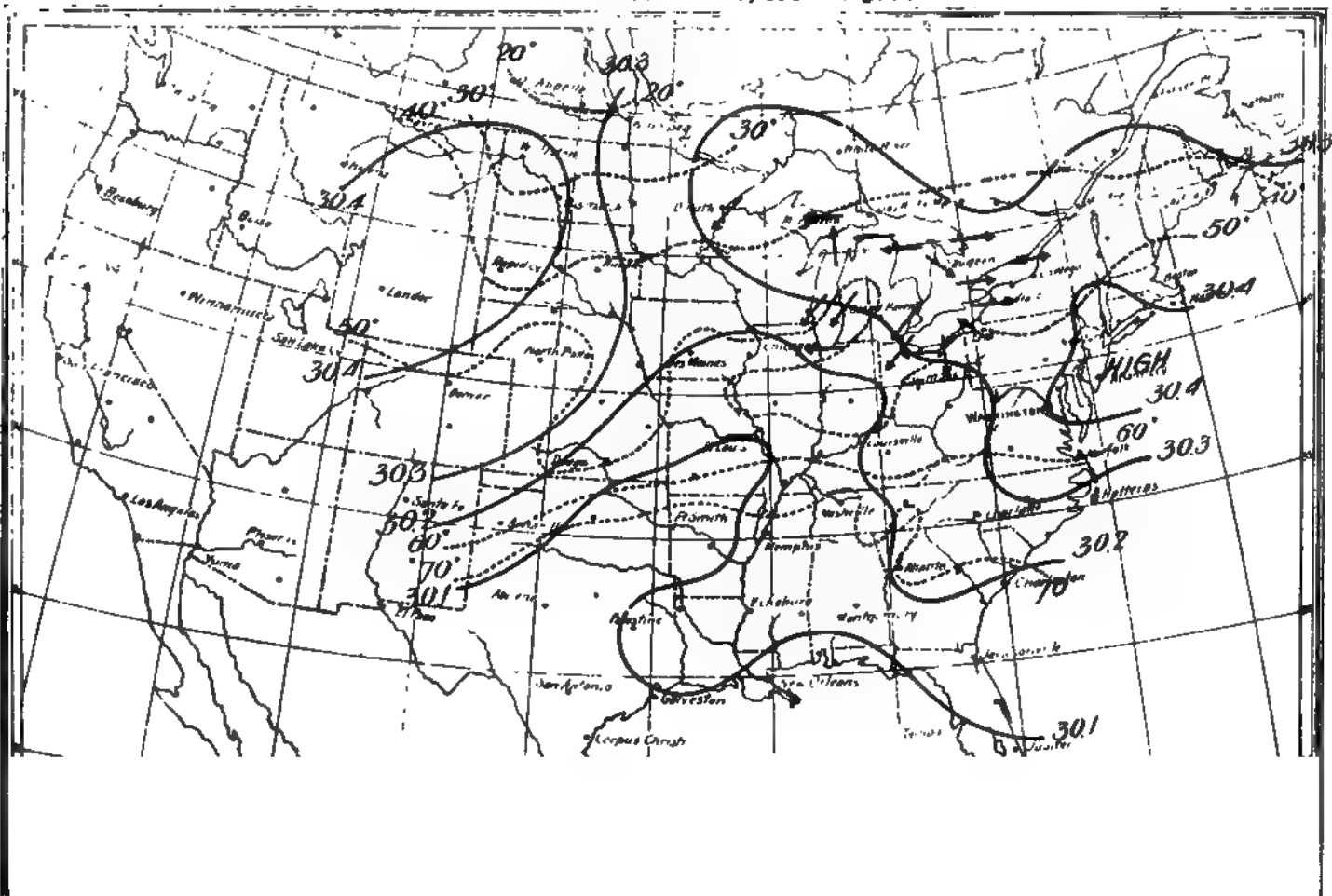


Chart DCOVII.

November 4, 1884—7 a. m.

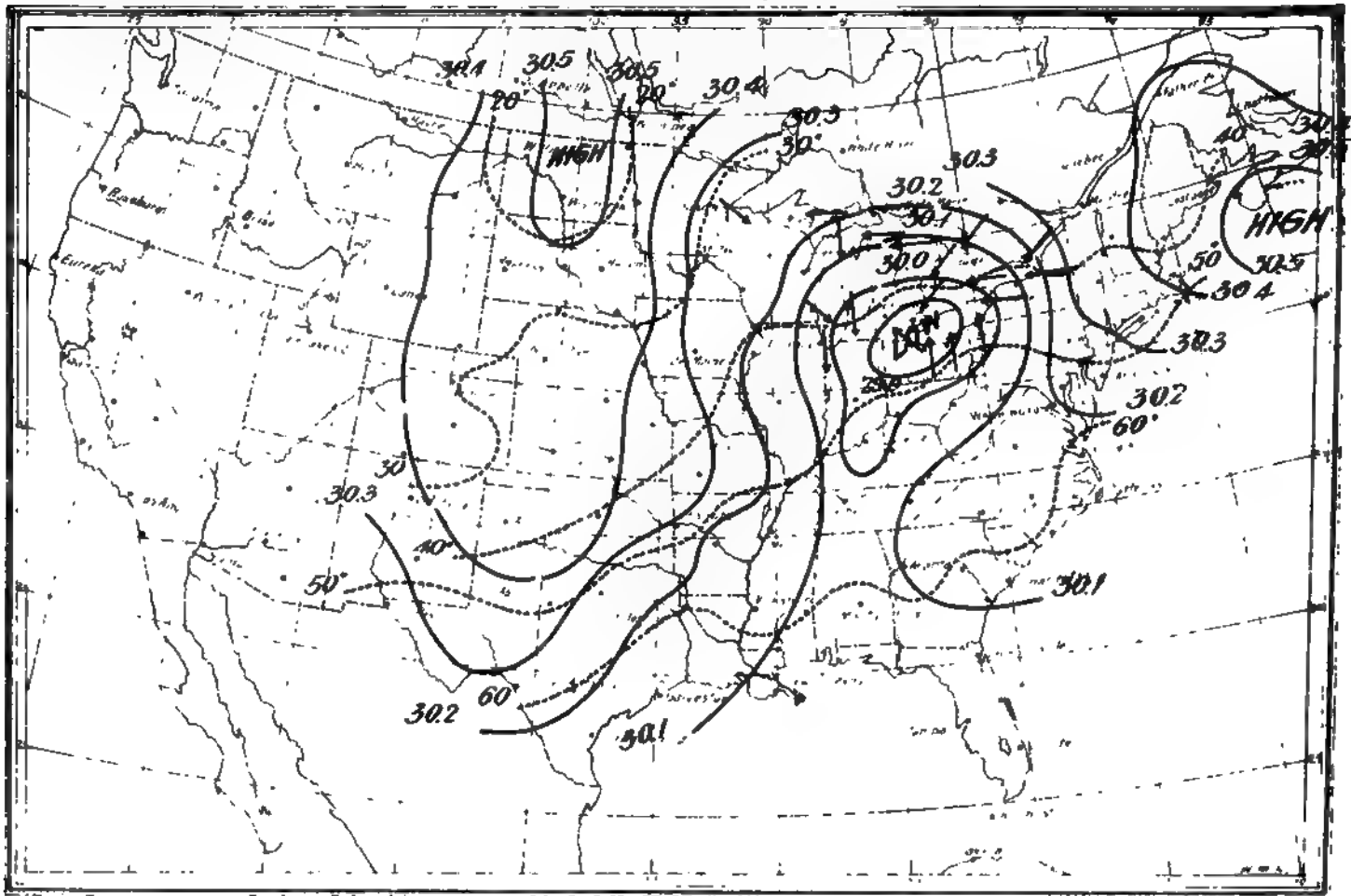
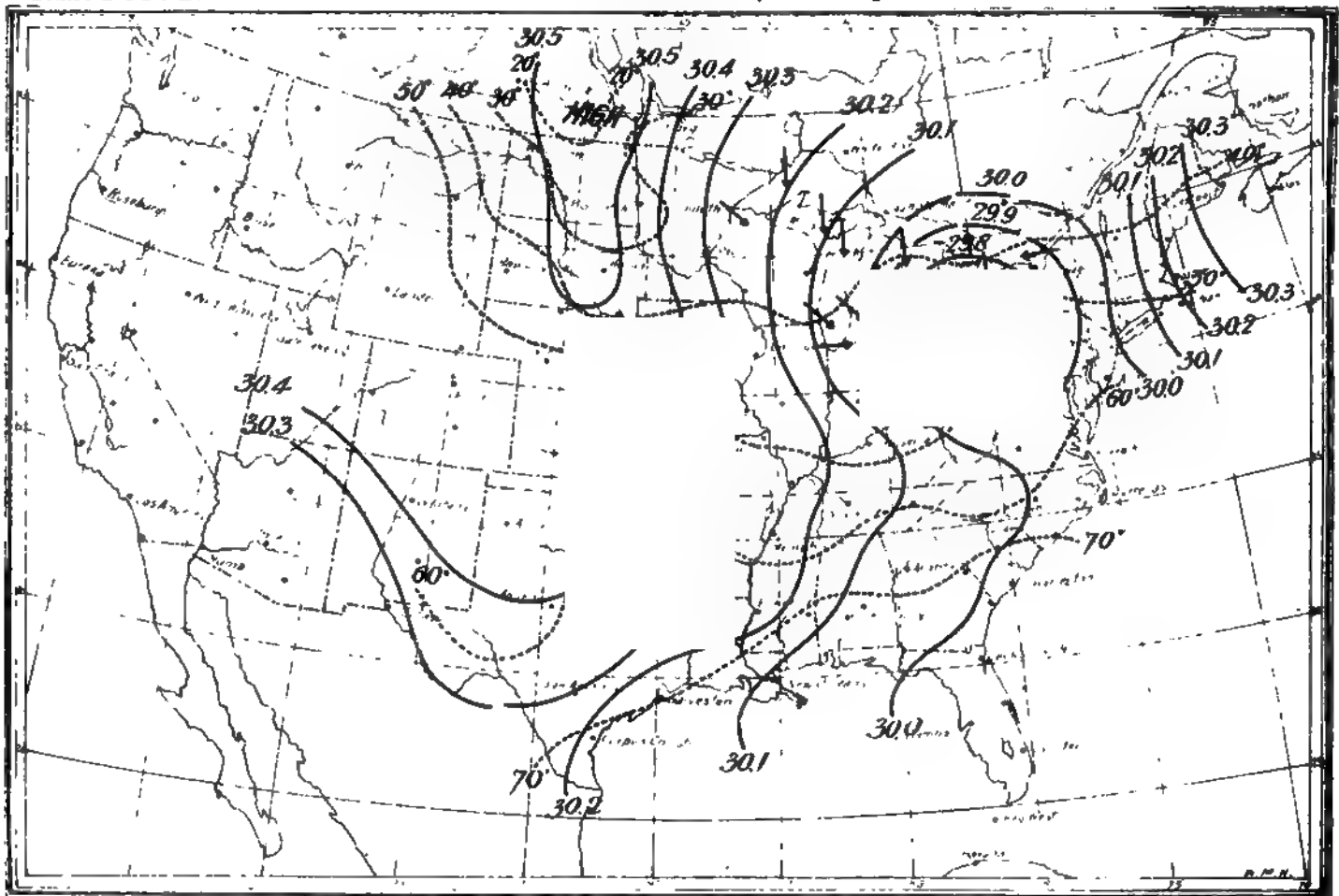


Chart DCOVIII.

November 4, 1884—3 p. m.



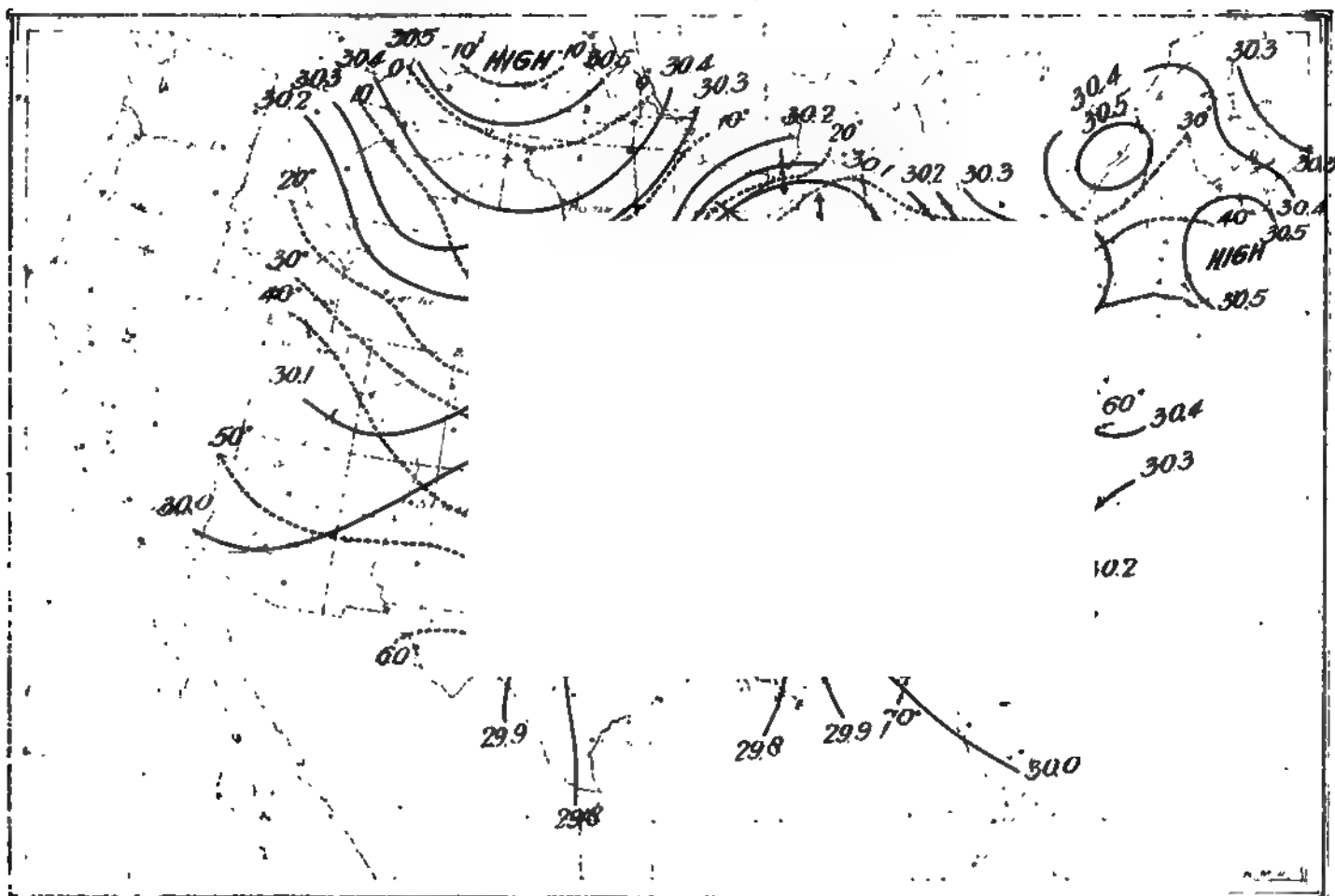


Chart DOXOV.

November 28, 1882—8 p. m.

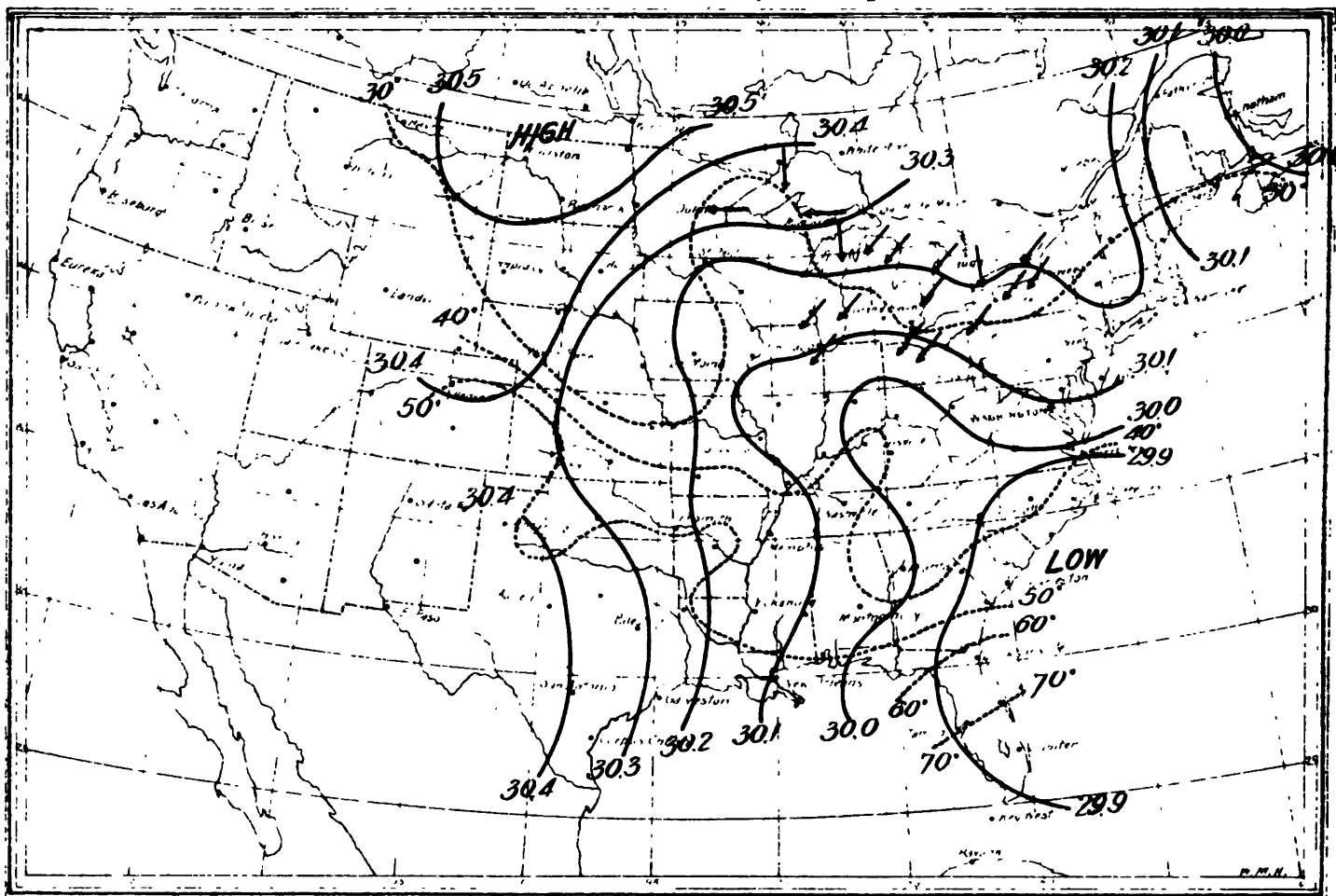


Chart DOXOVI.

November 29, 1882—7 a. m.

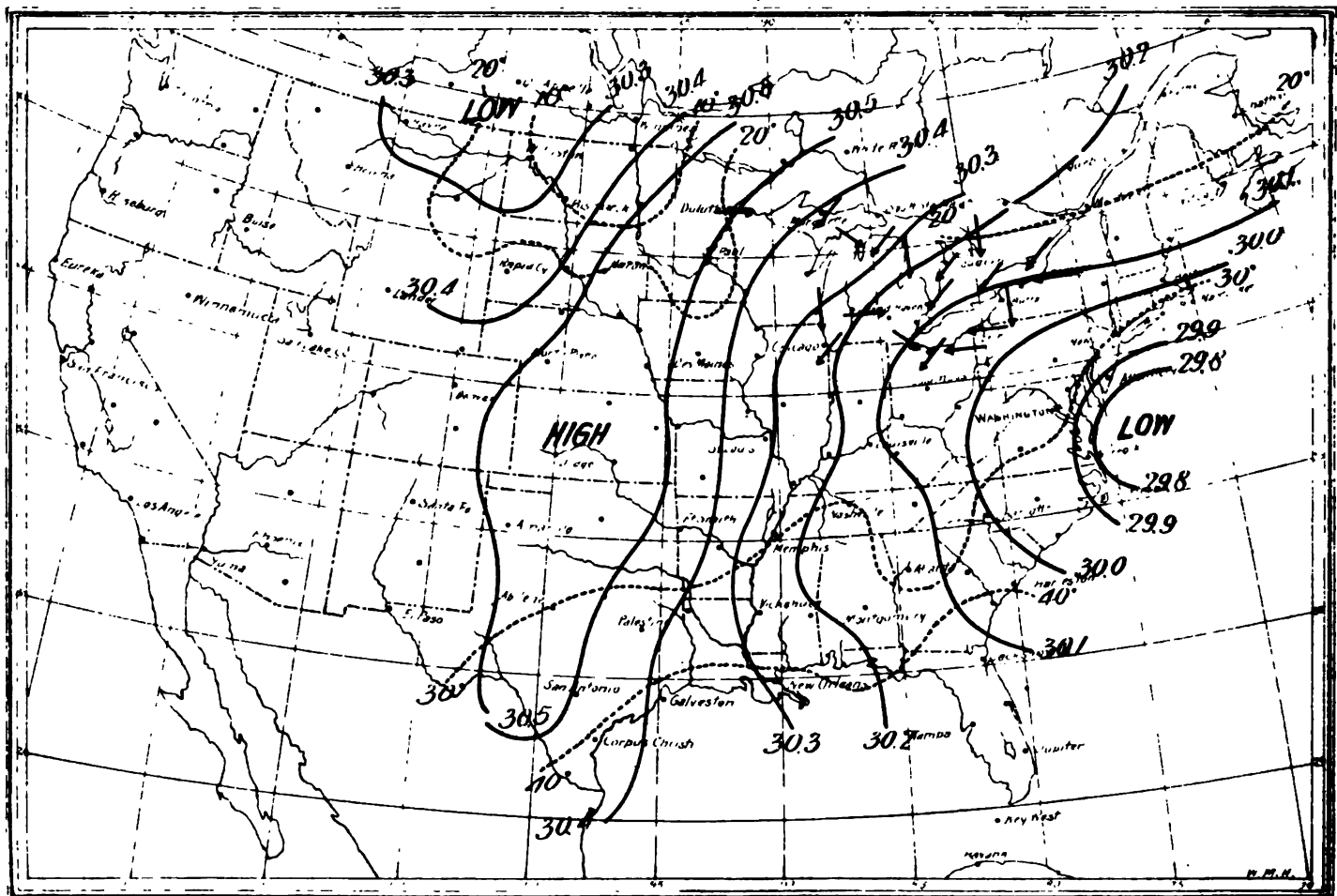


Chart DOXOVII.

November 10, 1888—7 a. m.

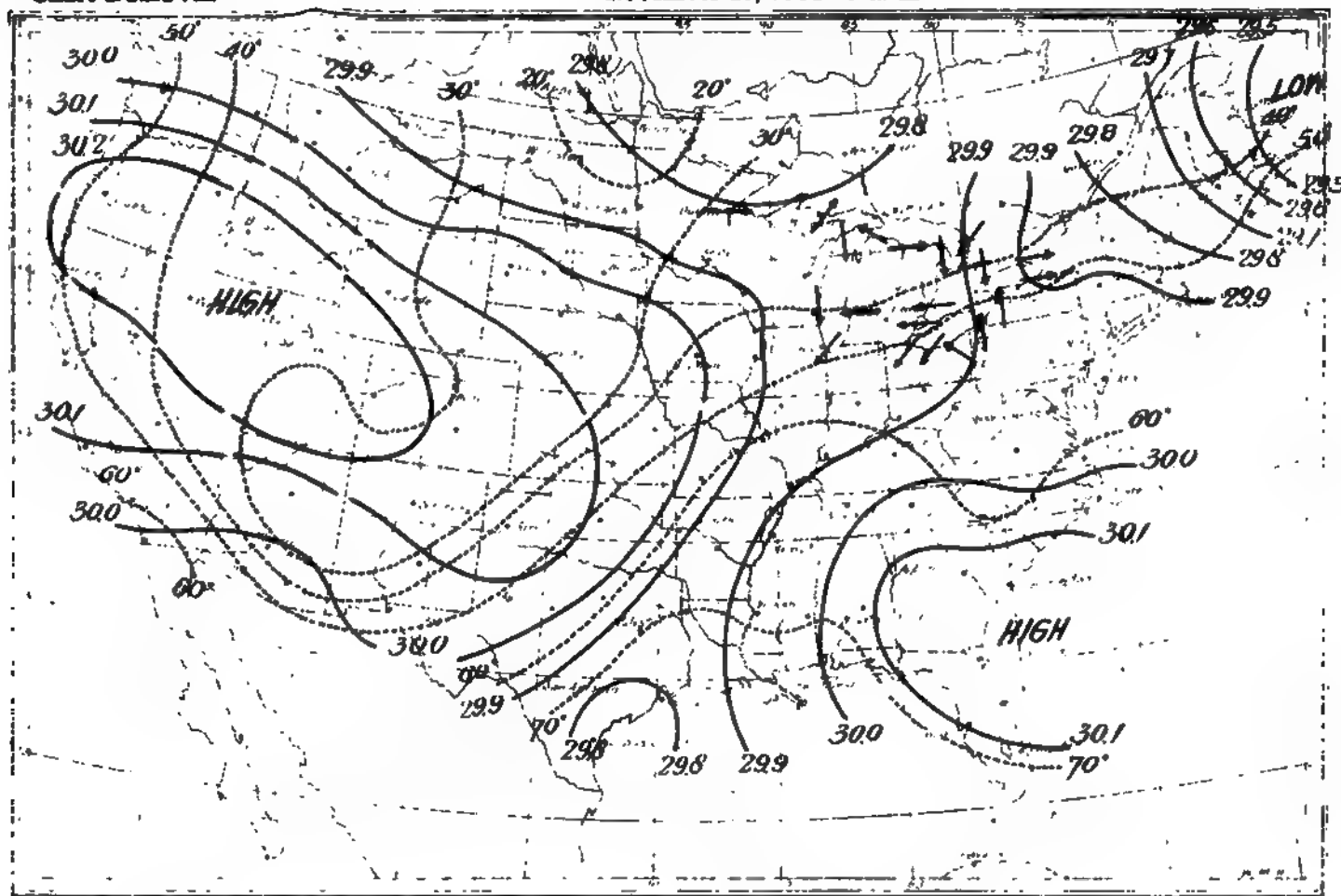


Chart DOXOVIII.

November 10, 1888—3 p. m.

Chart DOXIX.

November 11, 1888—7 a. m.

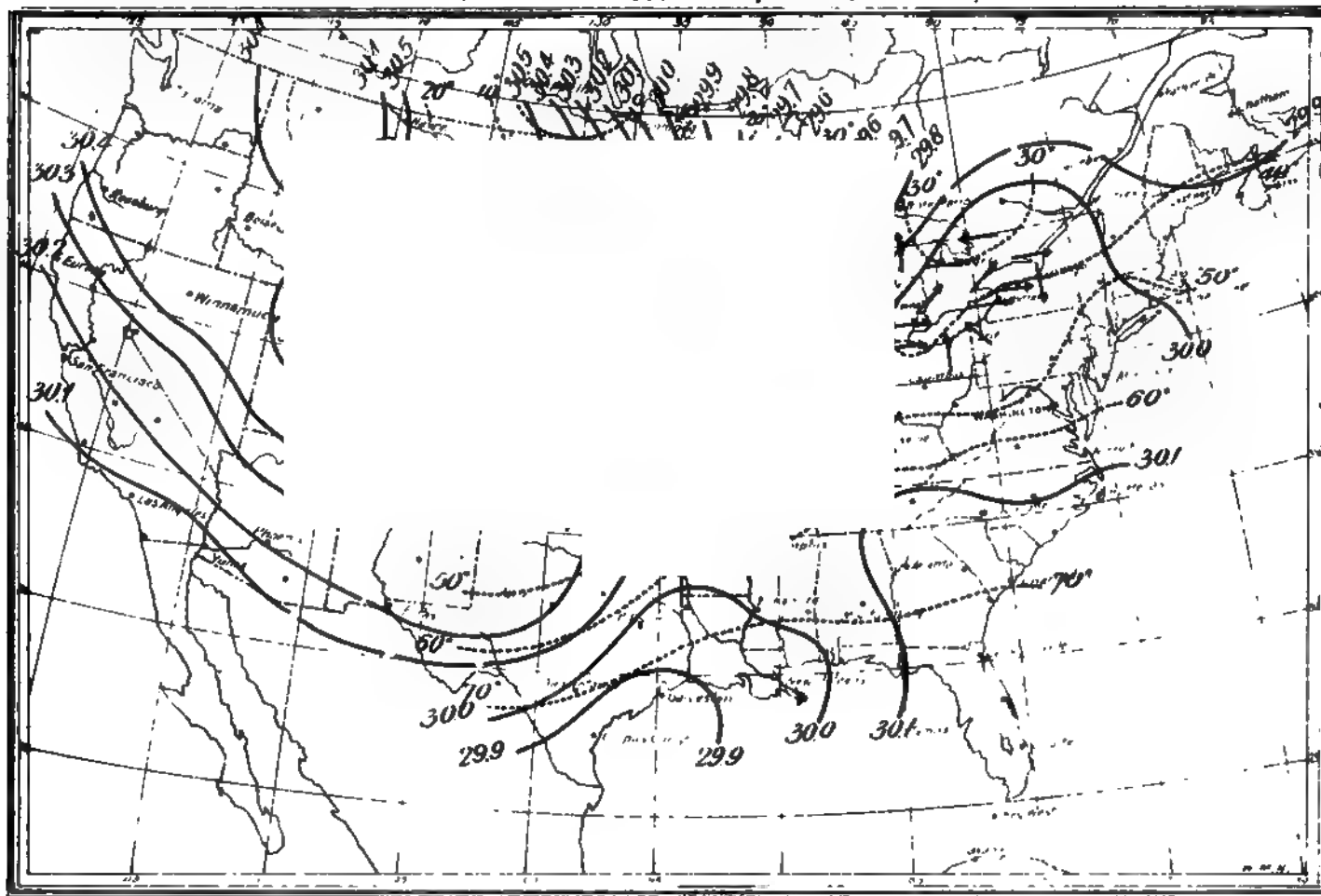
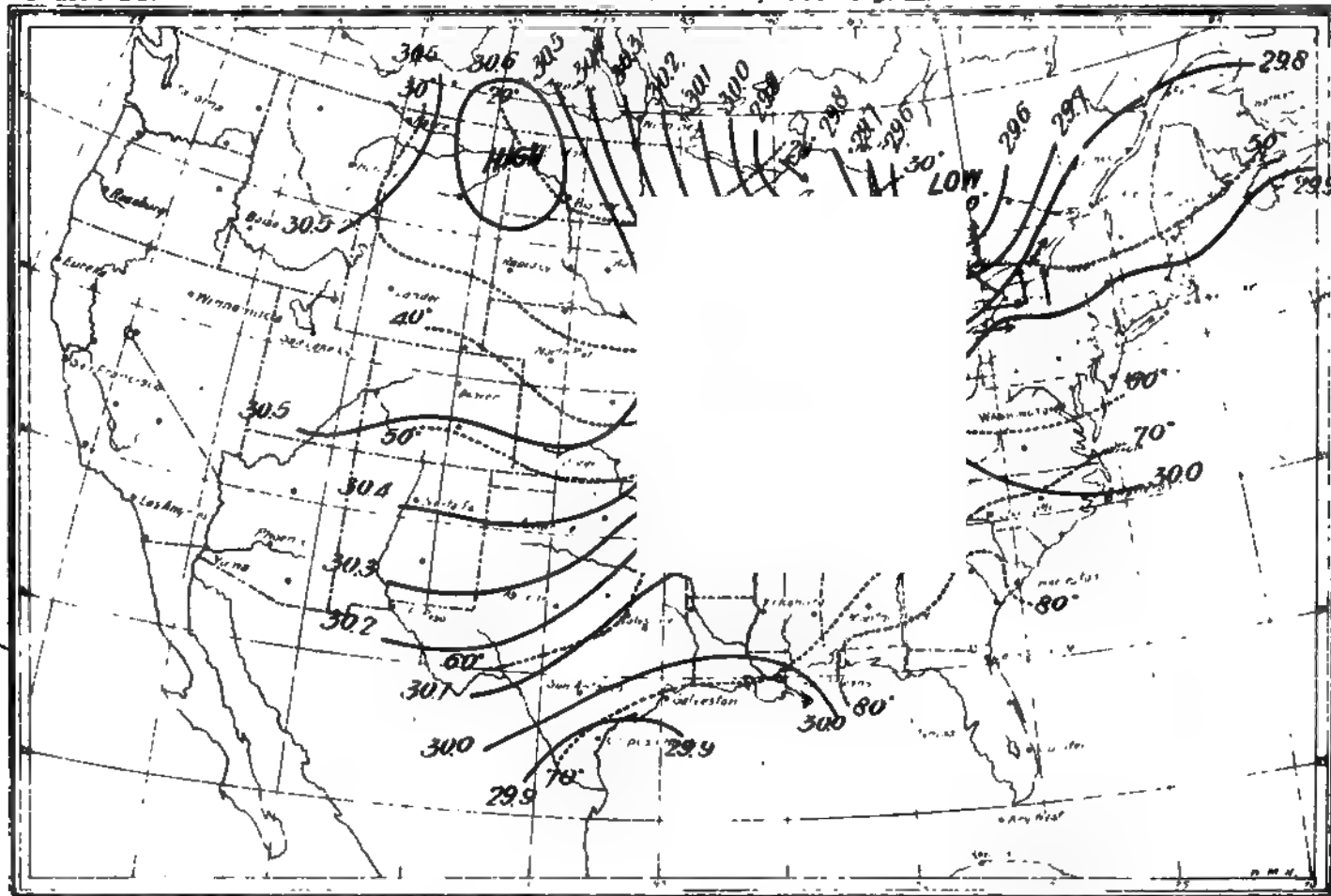


Chart DOO.

November 11, 1888—2 p. m.



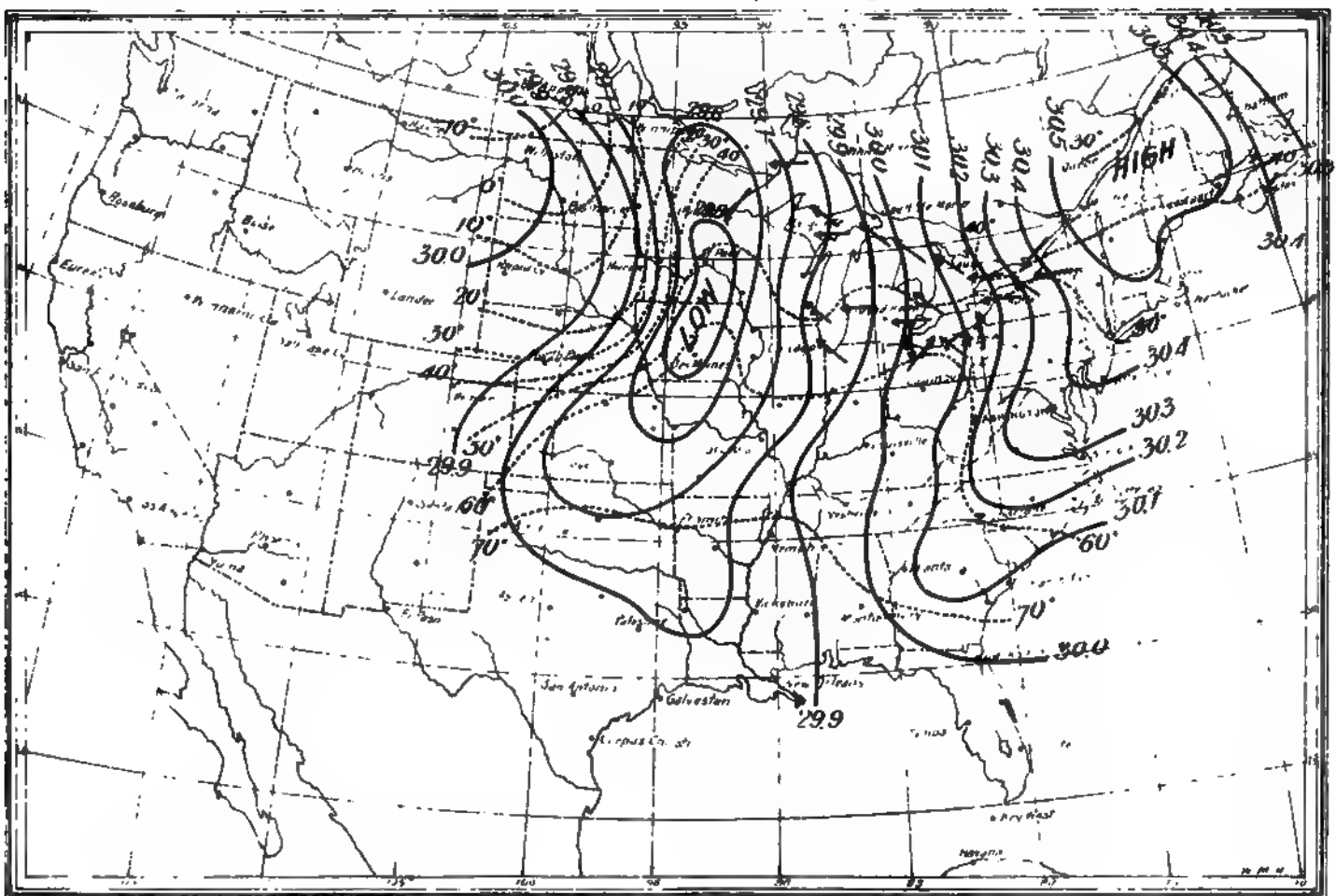


Chart DCCIII.

November 26, 1883--7 a. m.

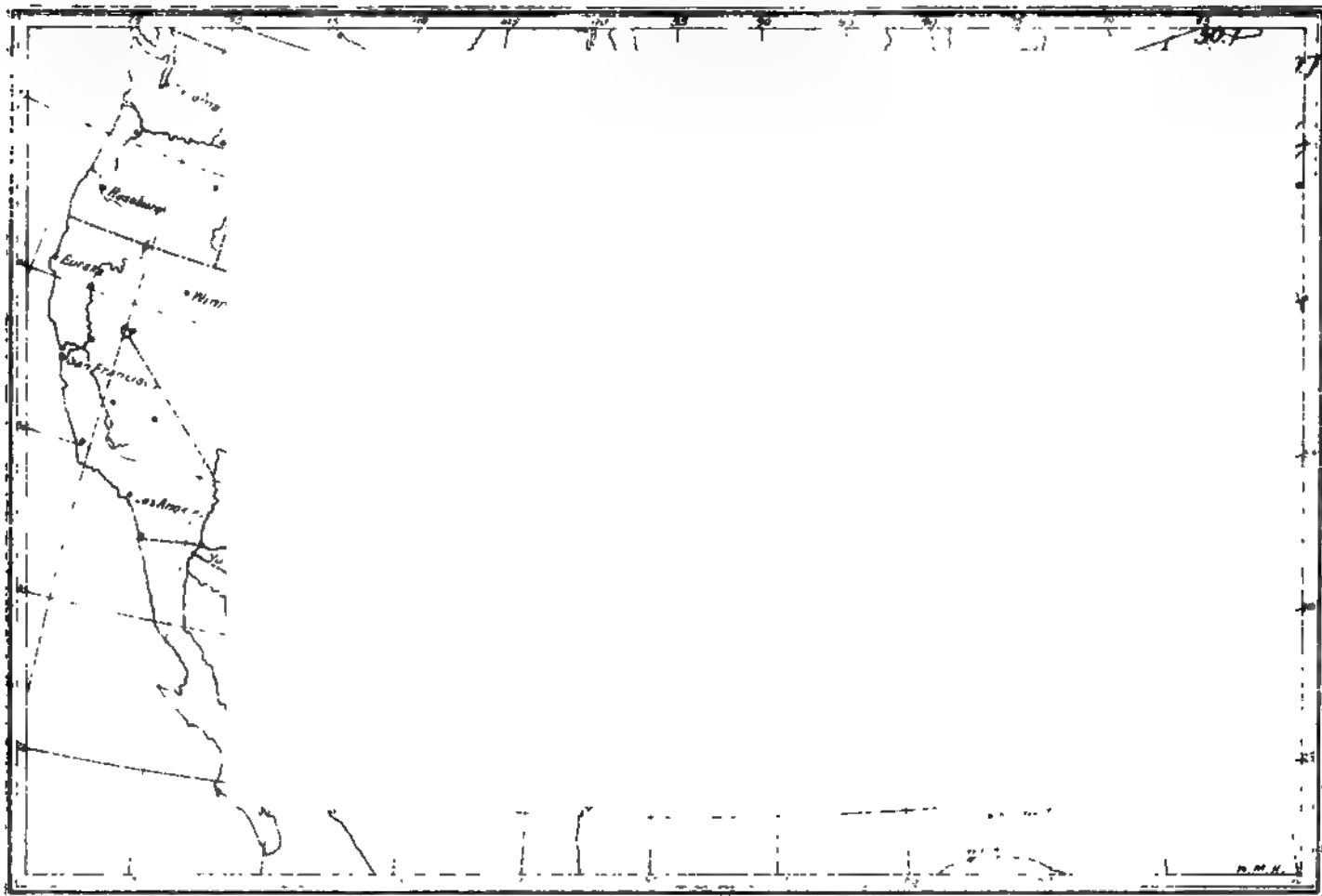


Chart DCCIV.

November 26, 1883--8 p. m.

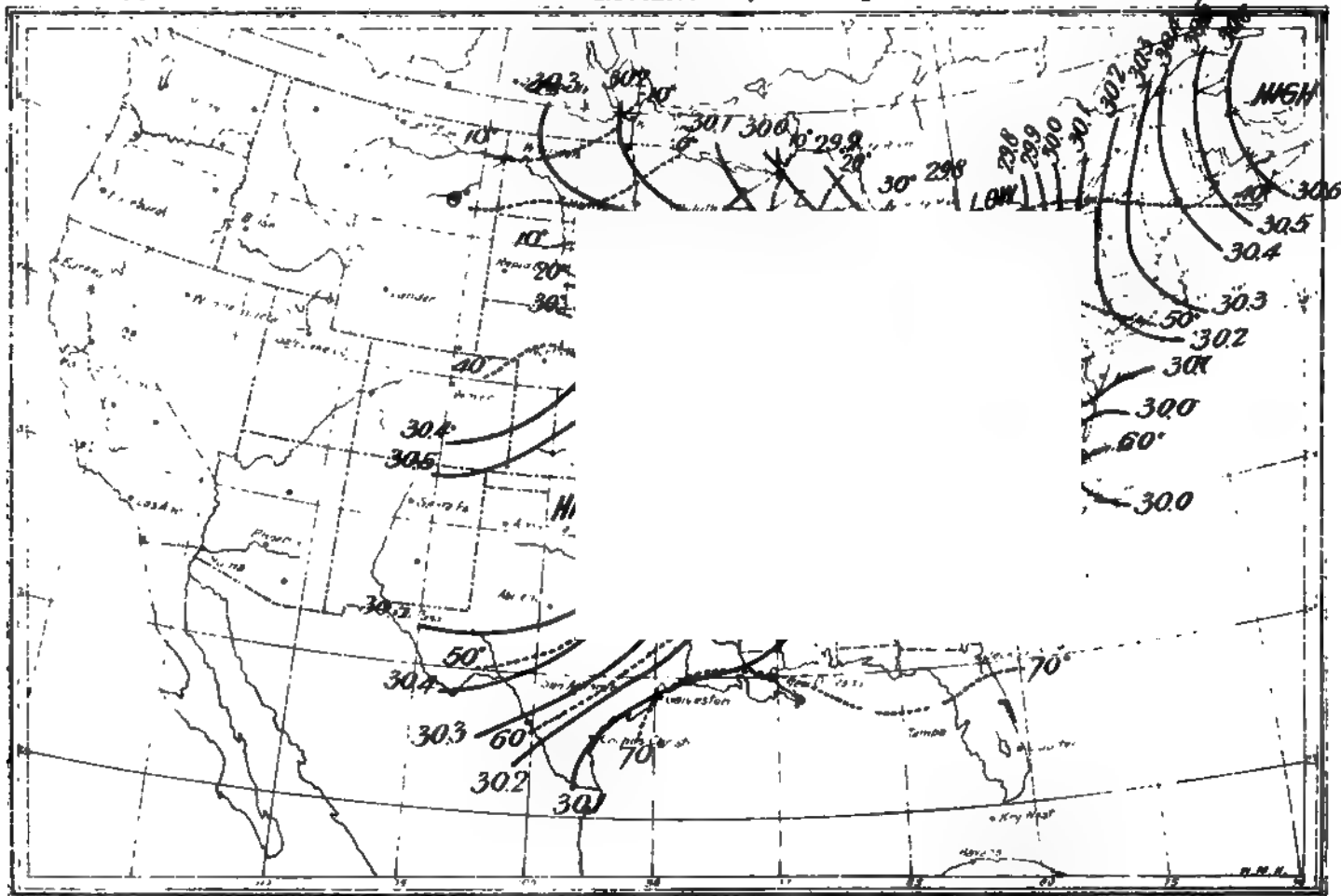


Chart DCOOV.

November 3, 1884—7 a. m.

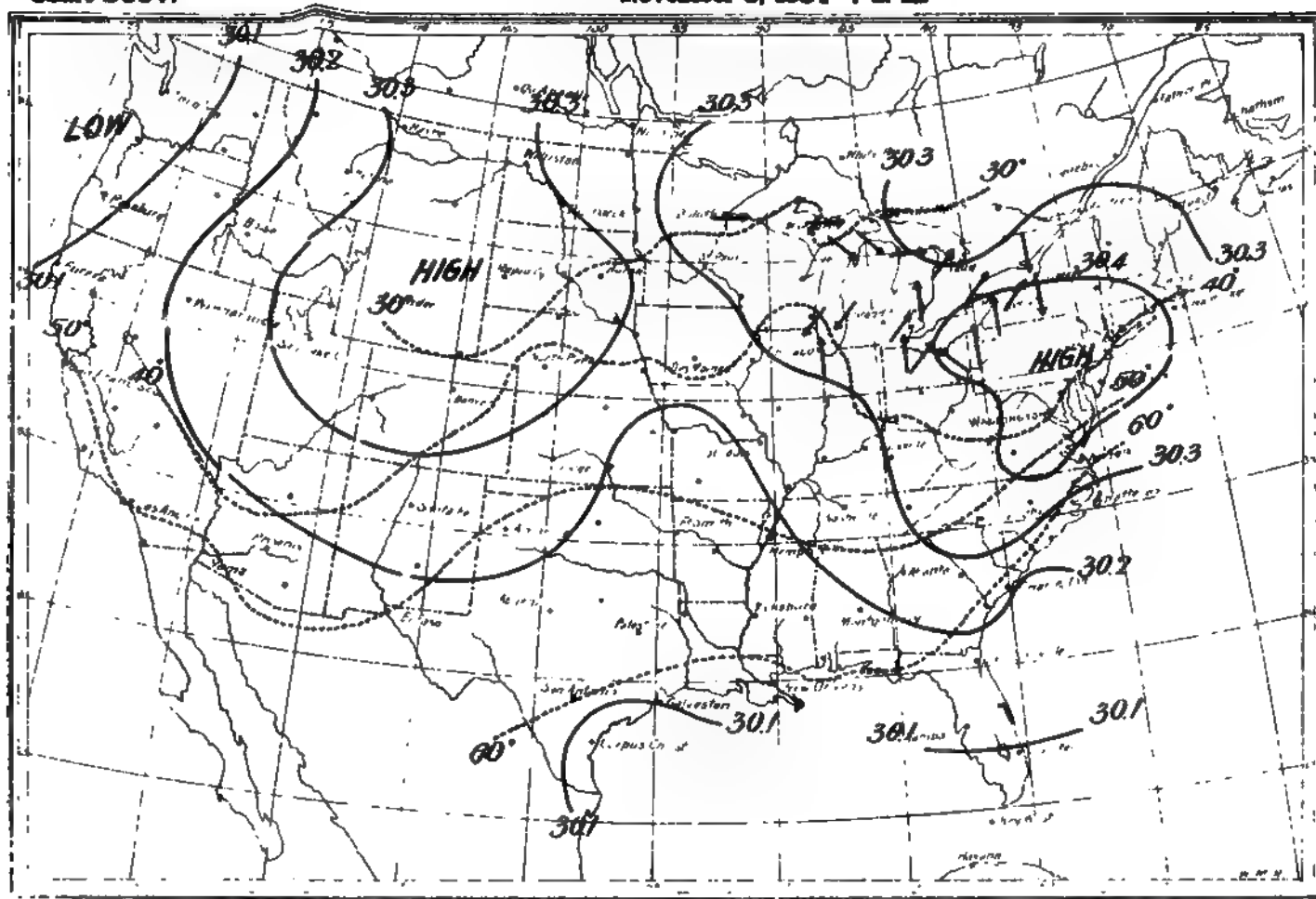


Chart DCOOVL

November 3, 1884—3 p. m.

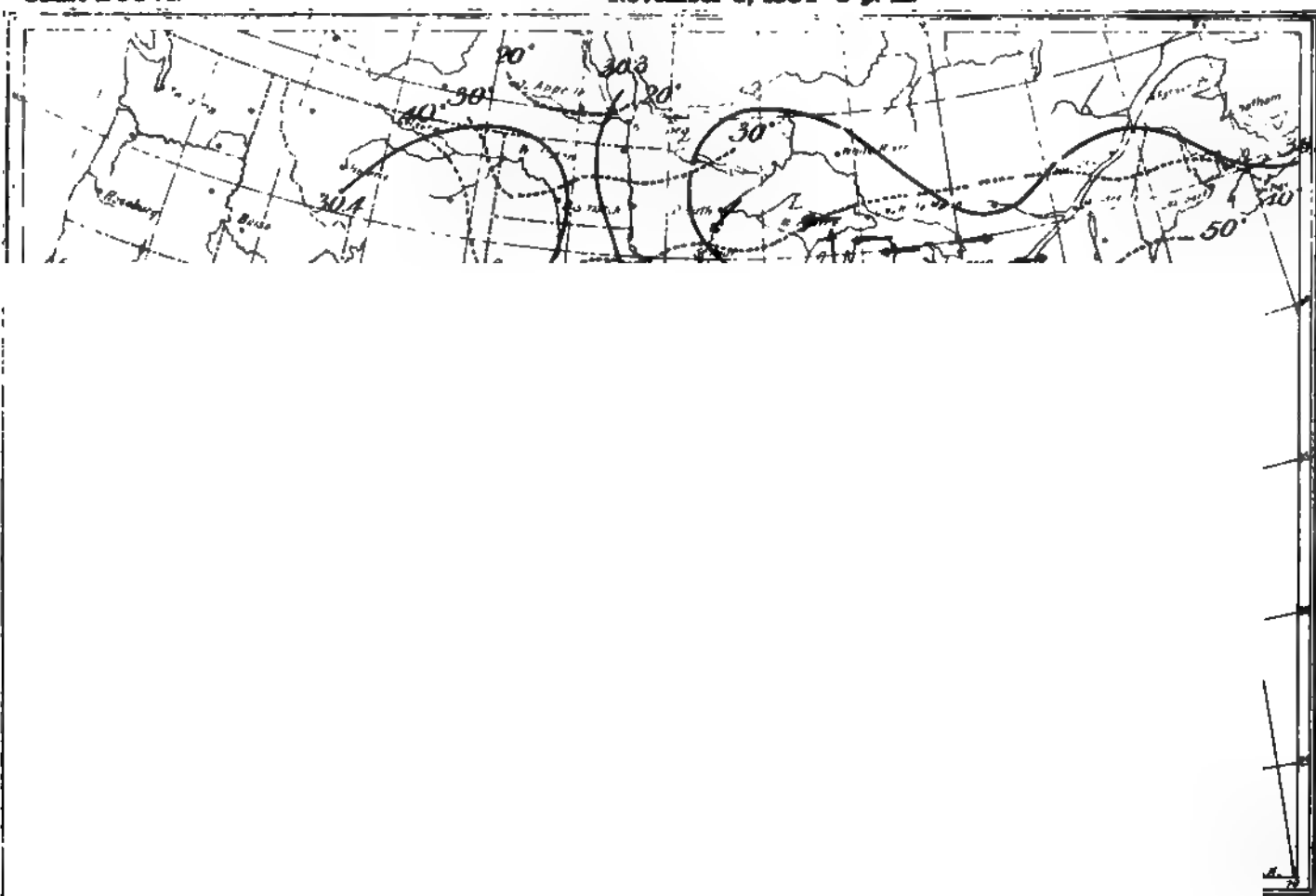


Chart DOOVII.

November 4, 1884—7 a. m.

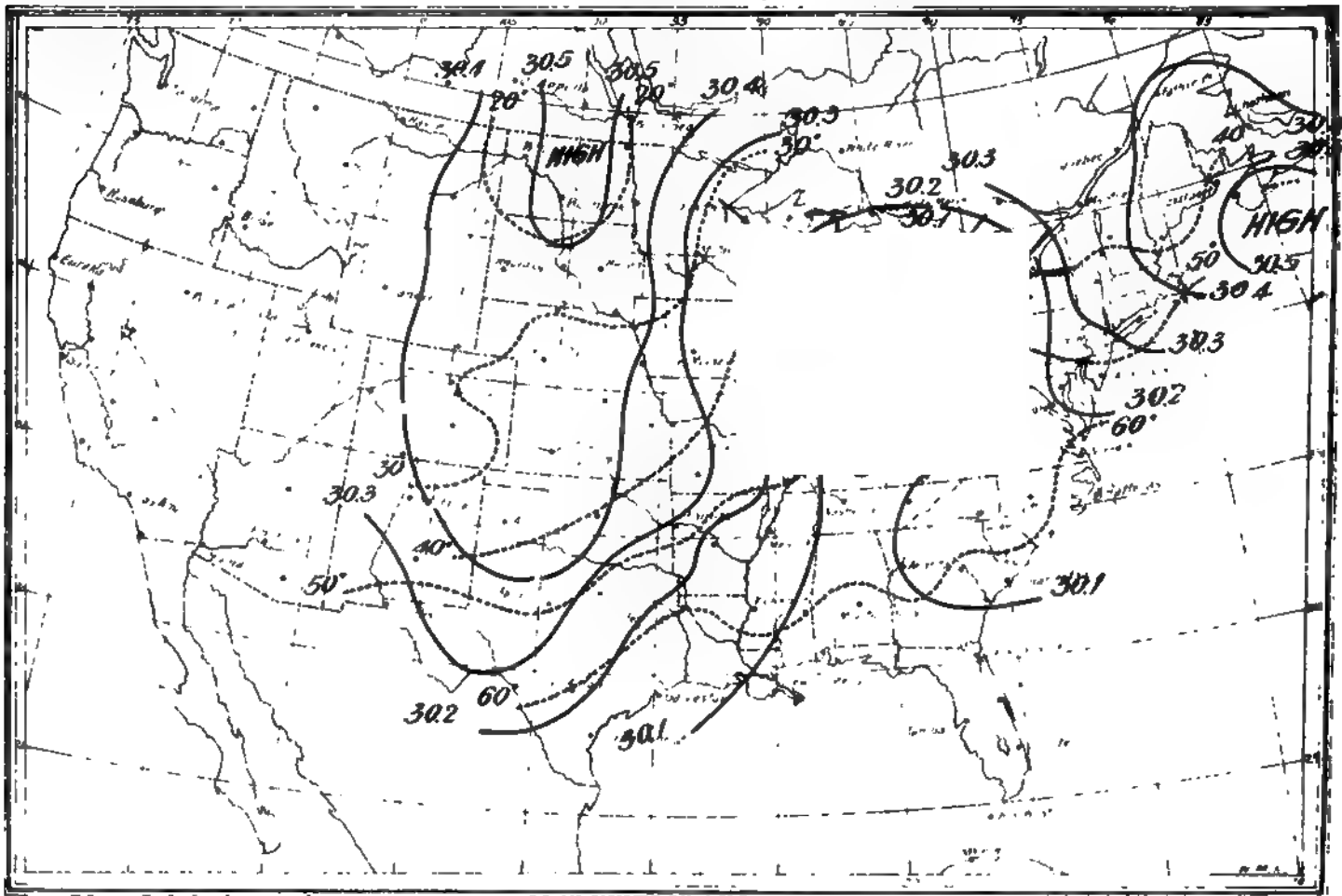
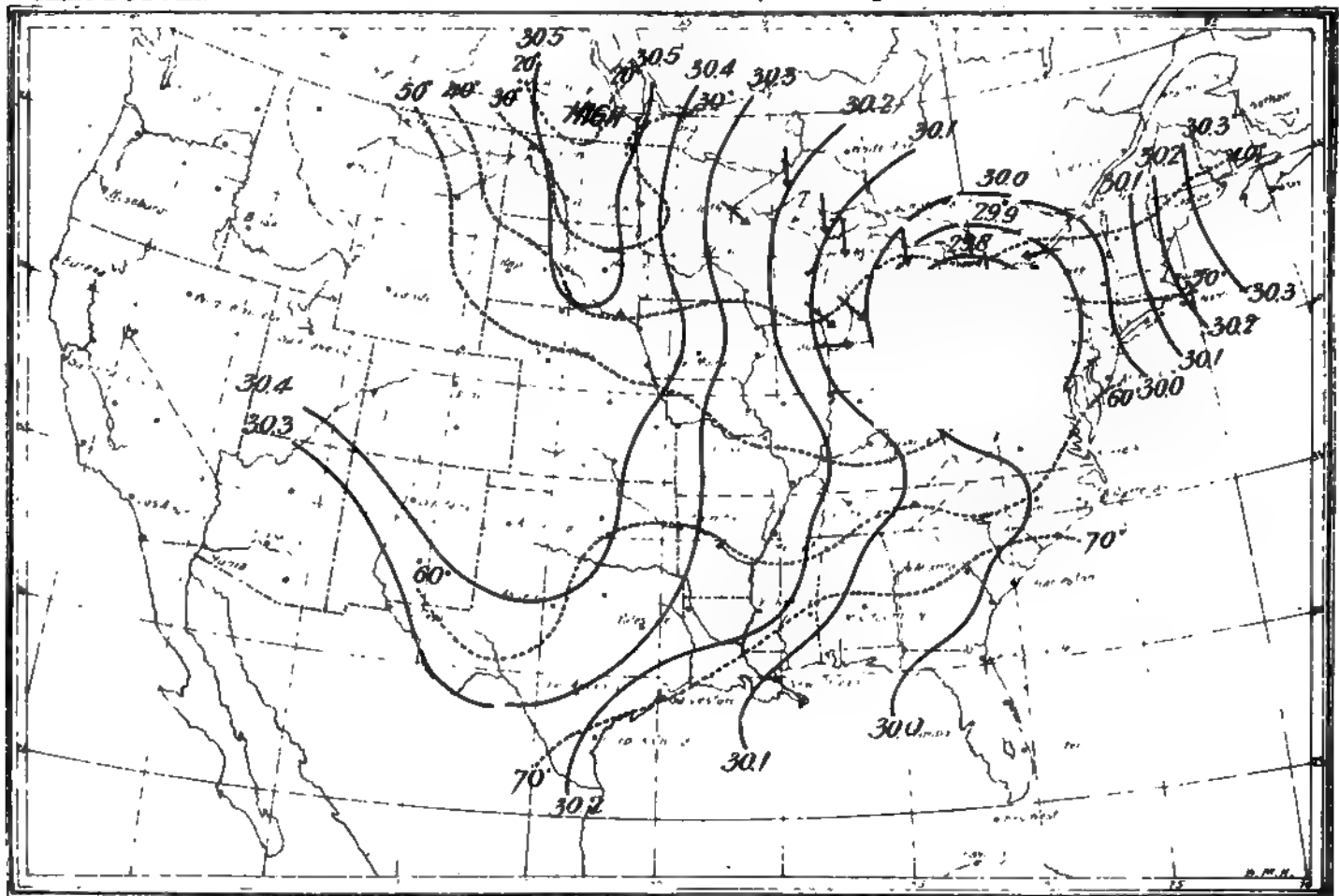


Chart DOOVIII.

November 4, 1884—3 p. m.



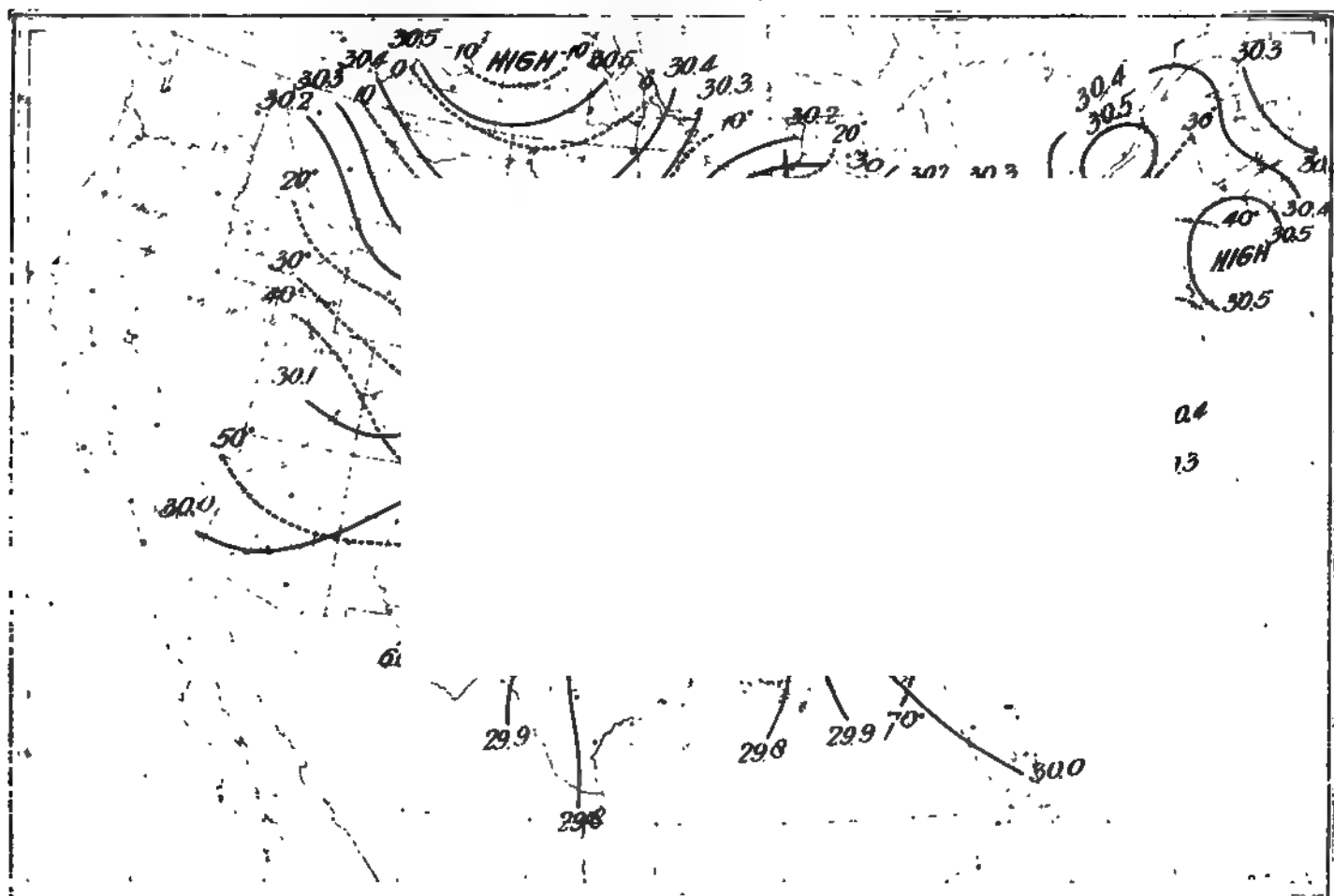


Chart DOCKI.

November 23, 1884—7 a. m.

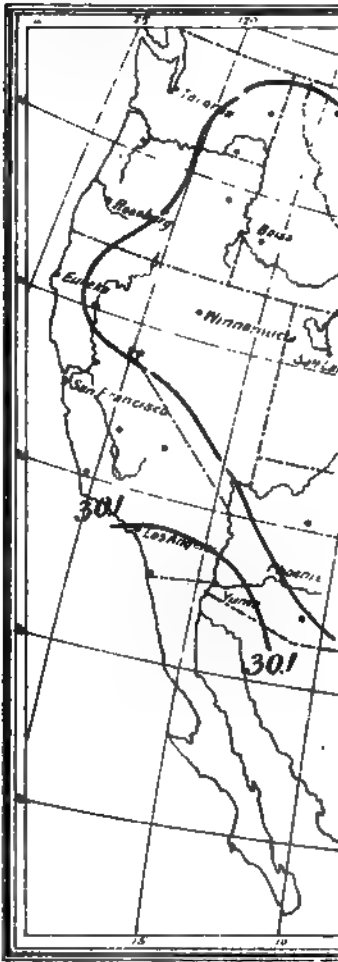


Chart DOCKII.

November 23, 1884—3 p. m.

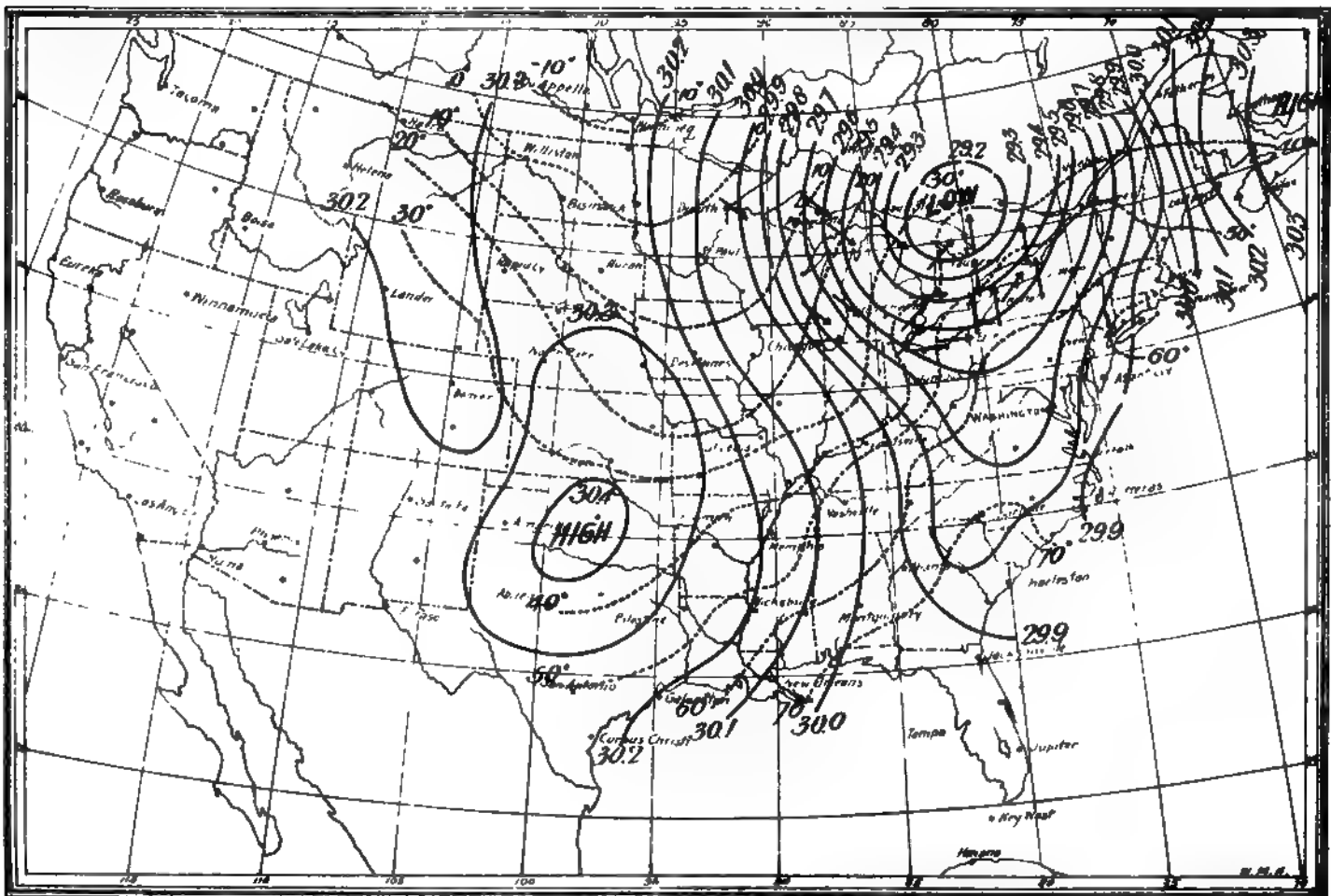


Chart DOCKIII.

November 6, 1885—7 a. m.

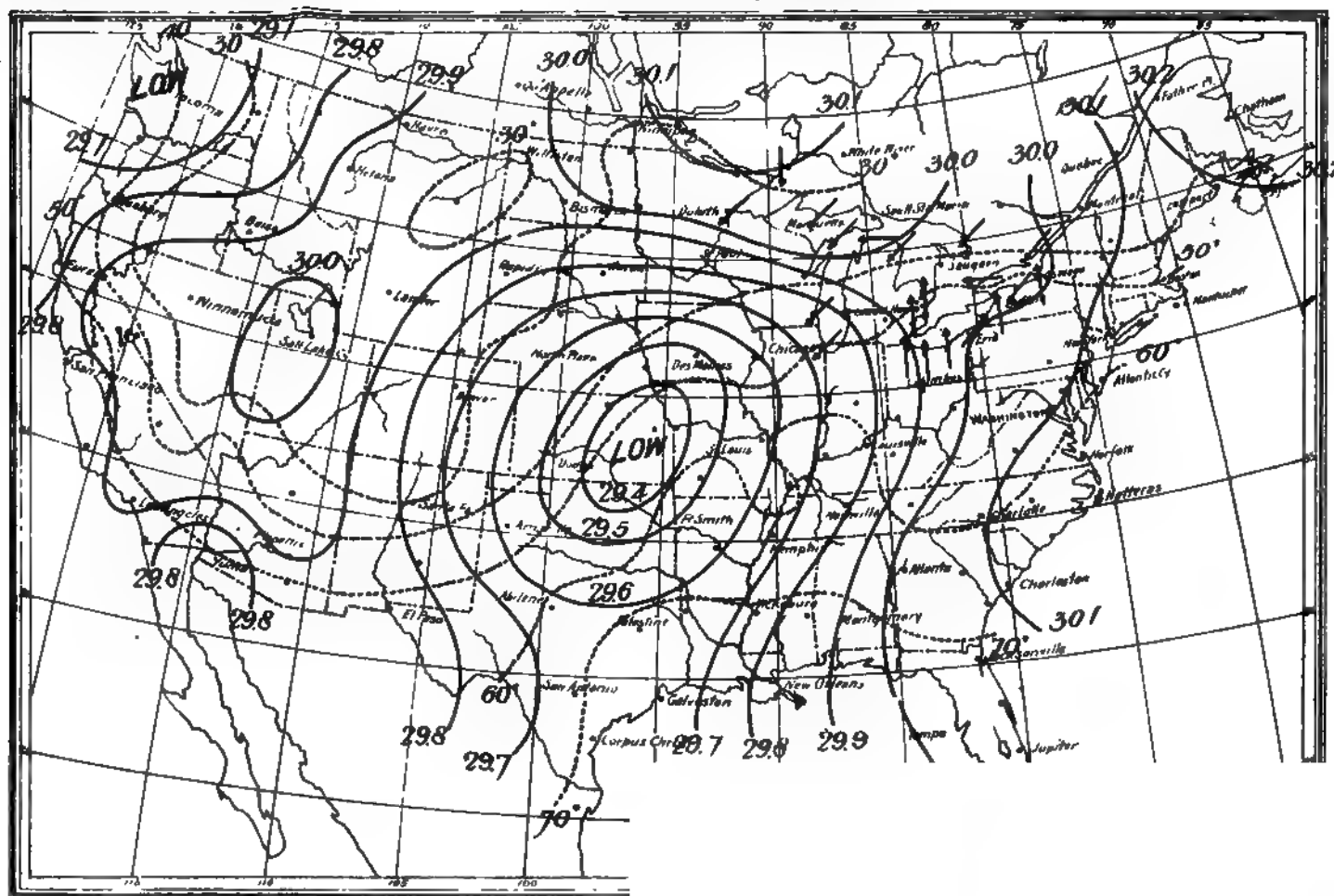


Chart DOCKIV.

November 6, 1885—3 p. m.

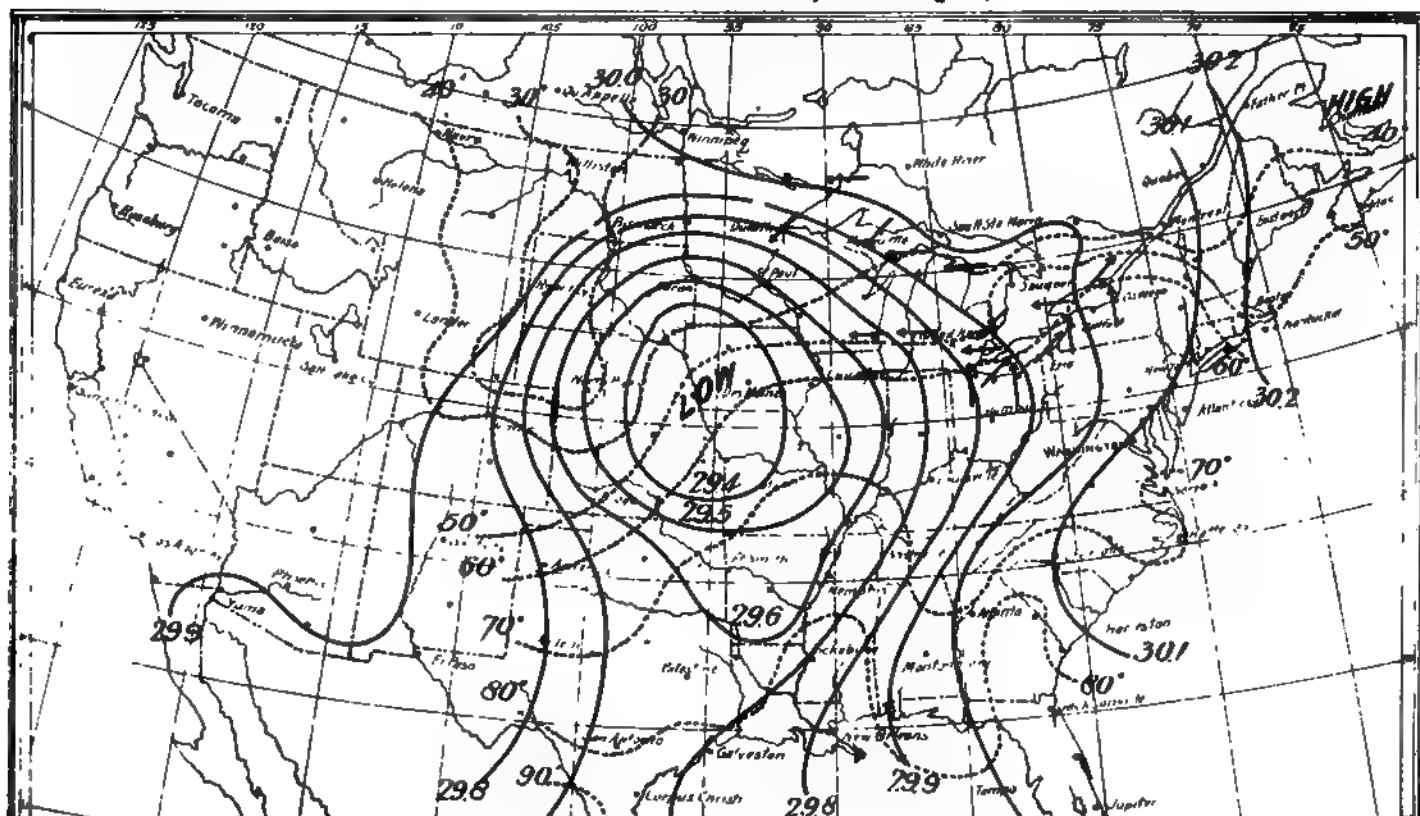


Chart DCCXV.

November 7, 1885—7 a. m.

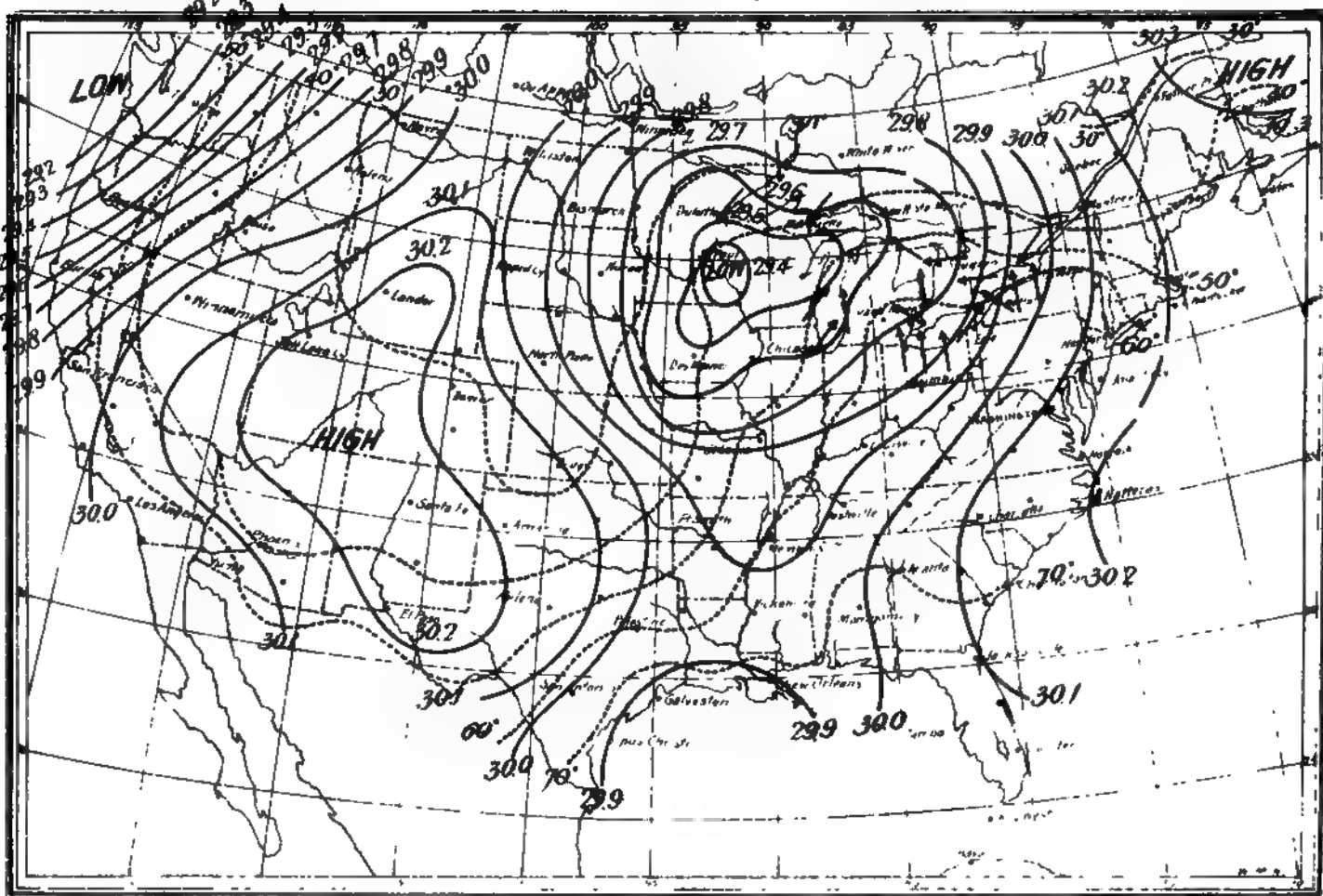
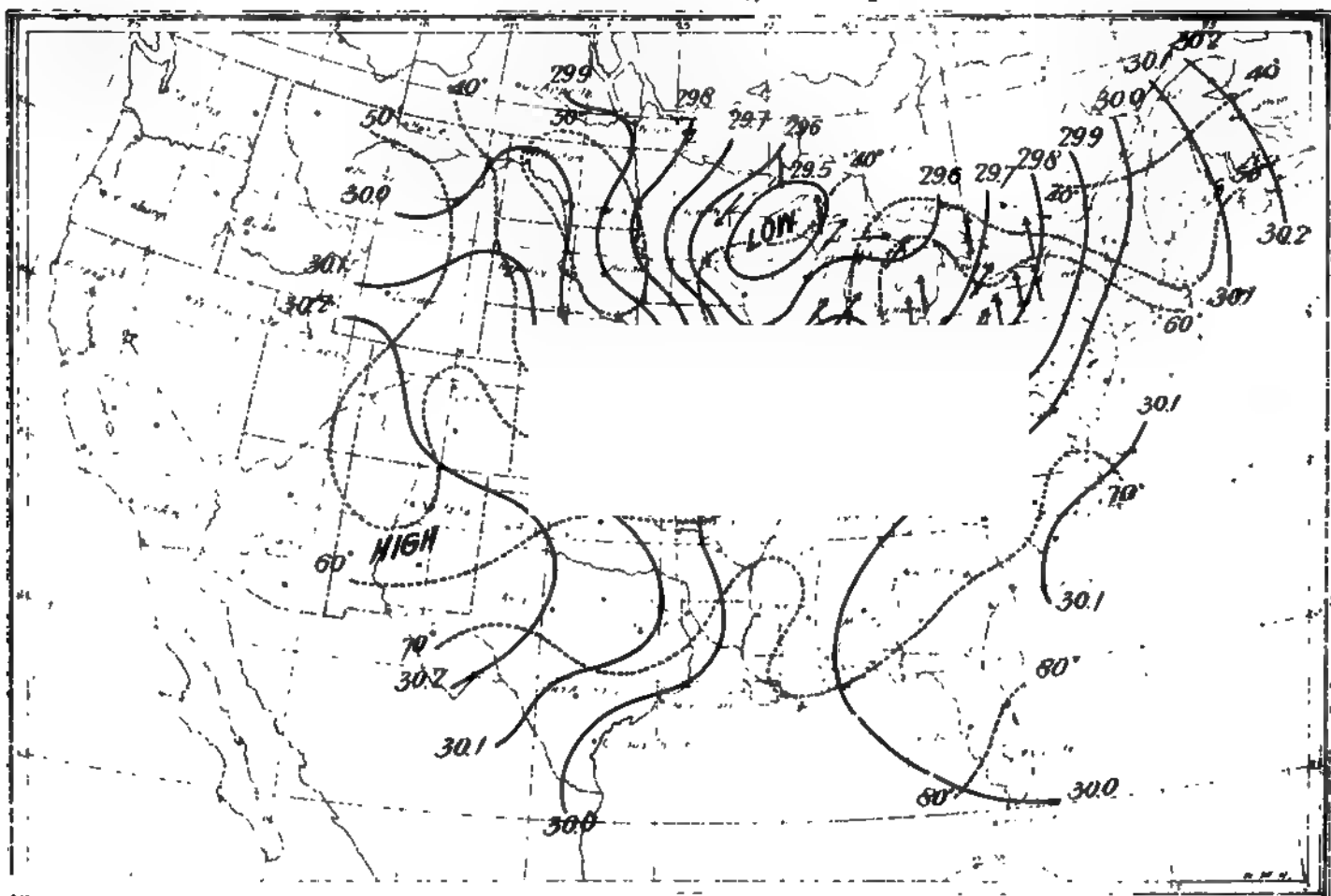
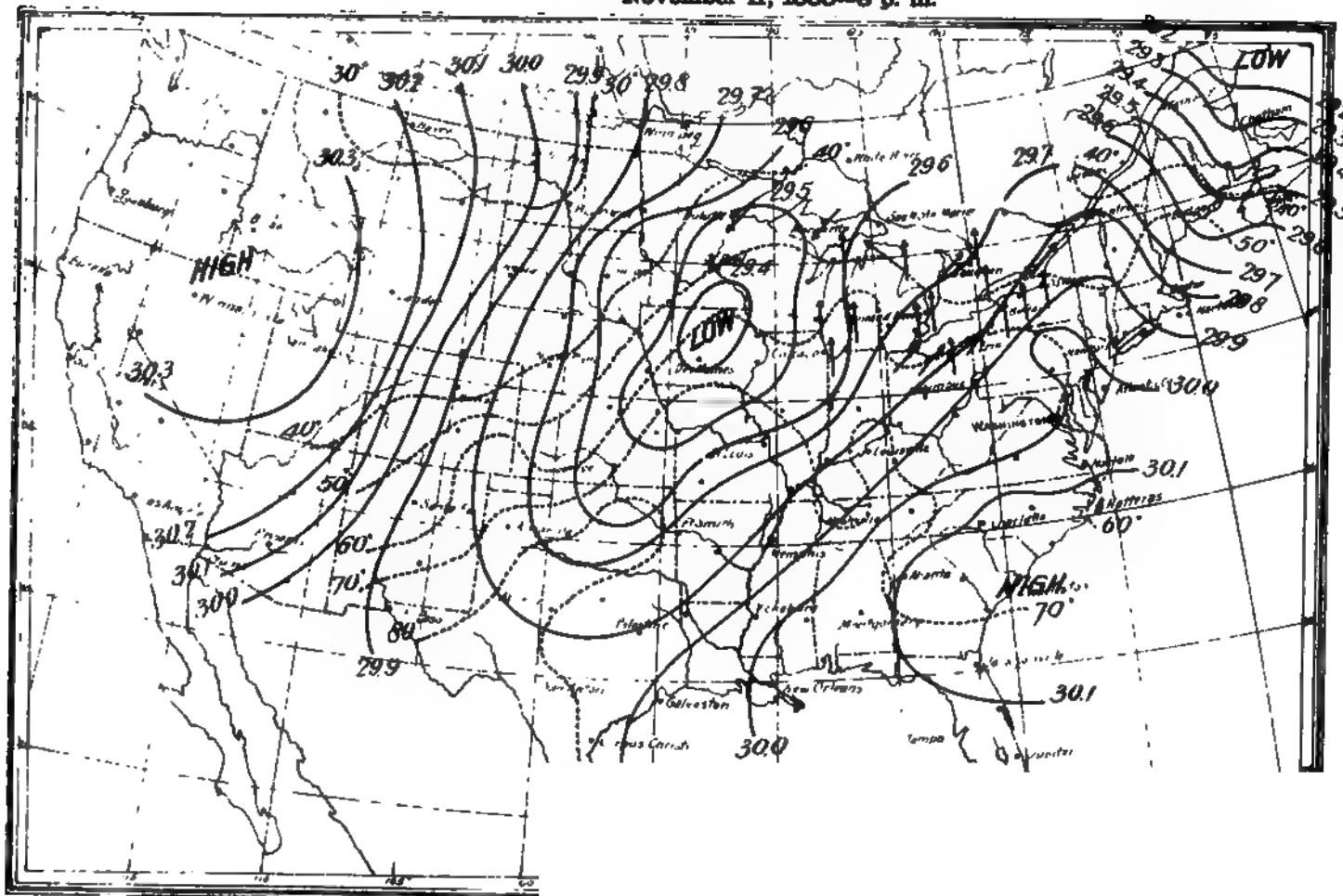


Chart DCCXVI.

November 7, 1885—3 p. m.





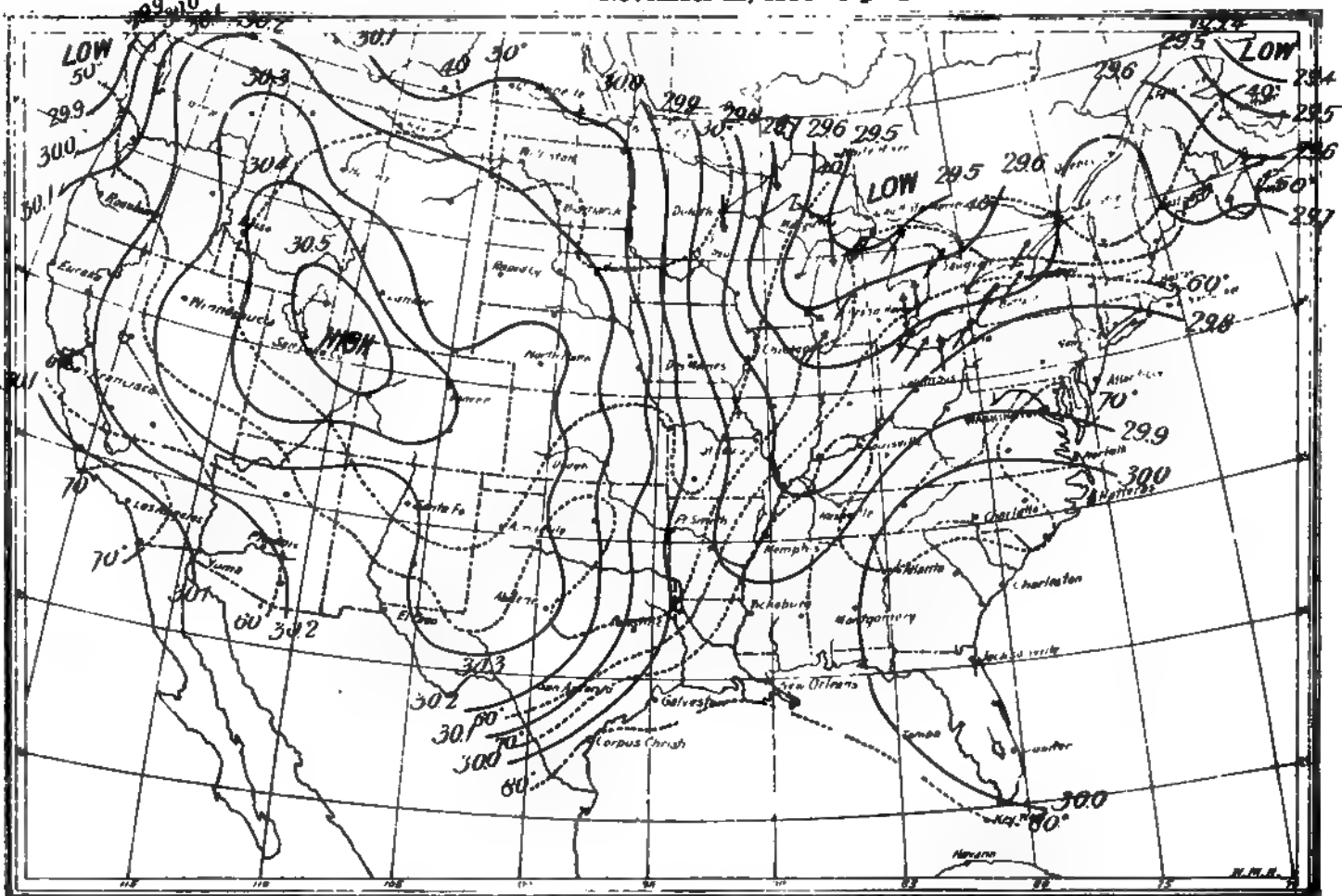
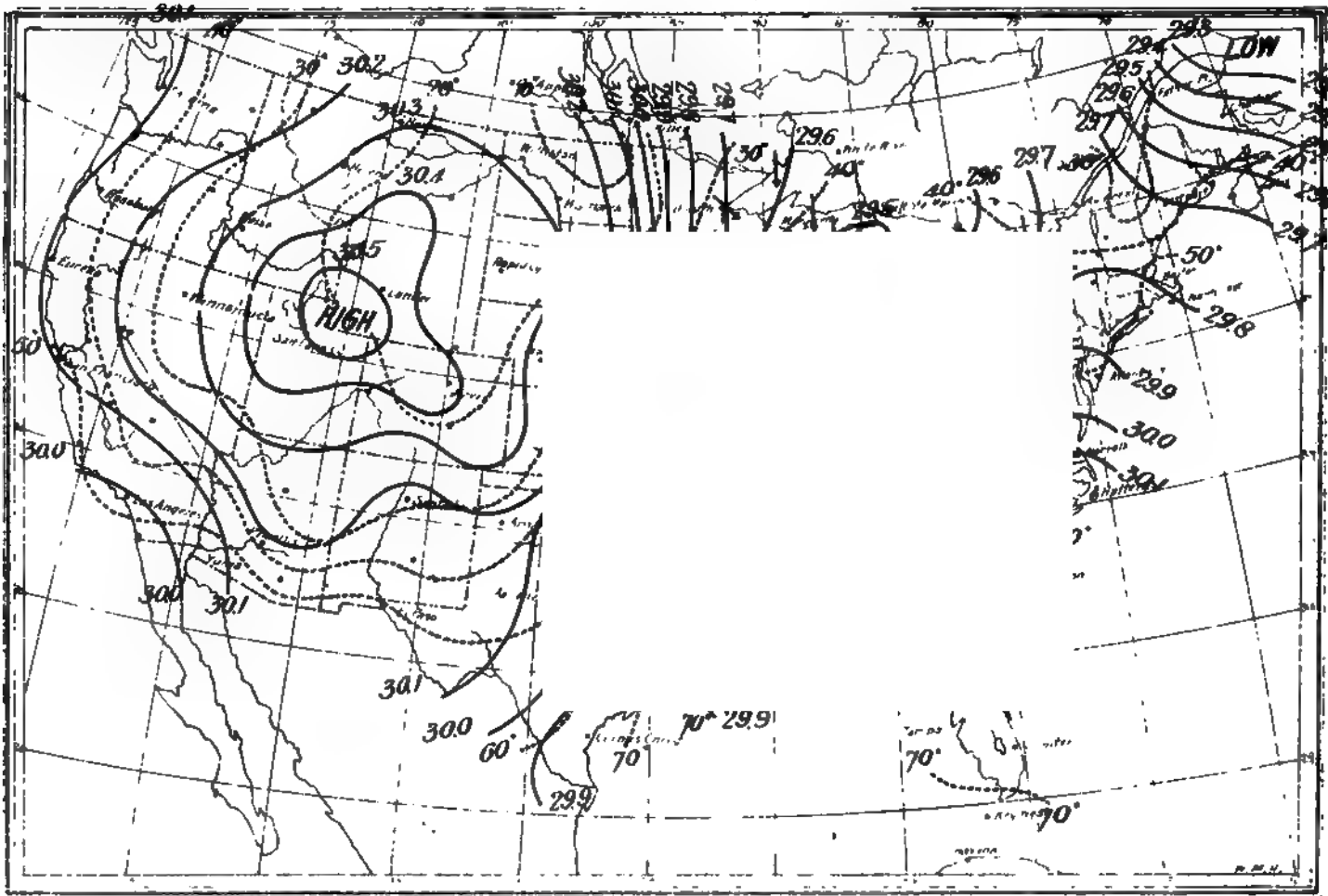


Chart DCCXXI.

November 16, 1886—3 p. m.

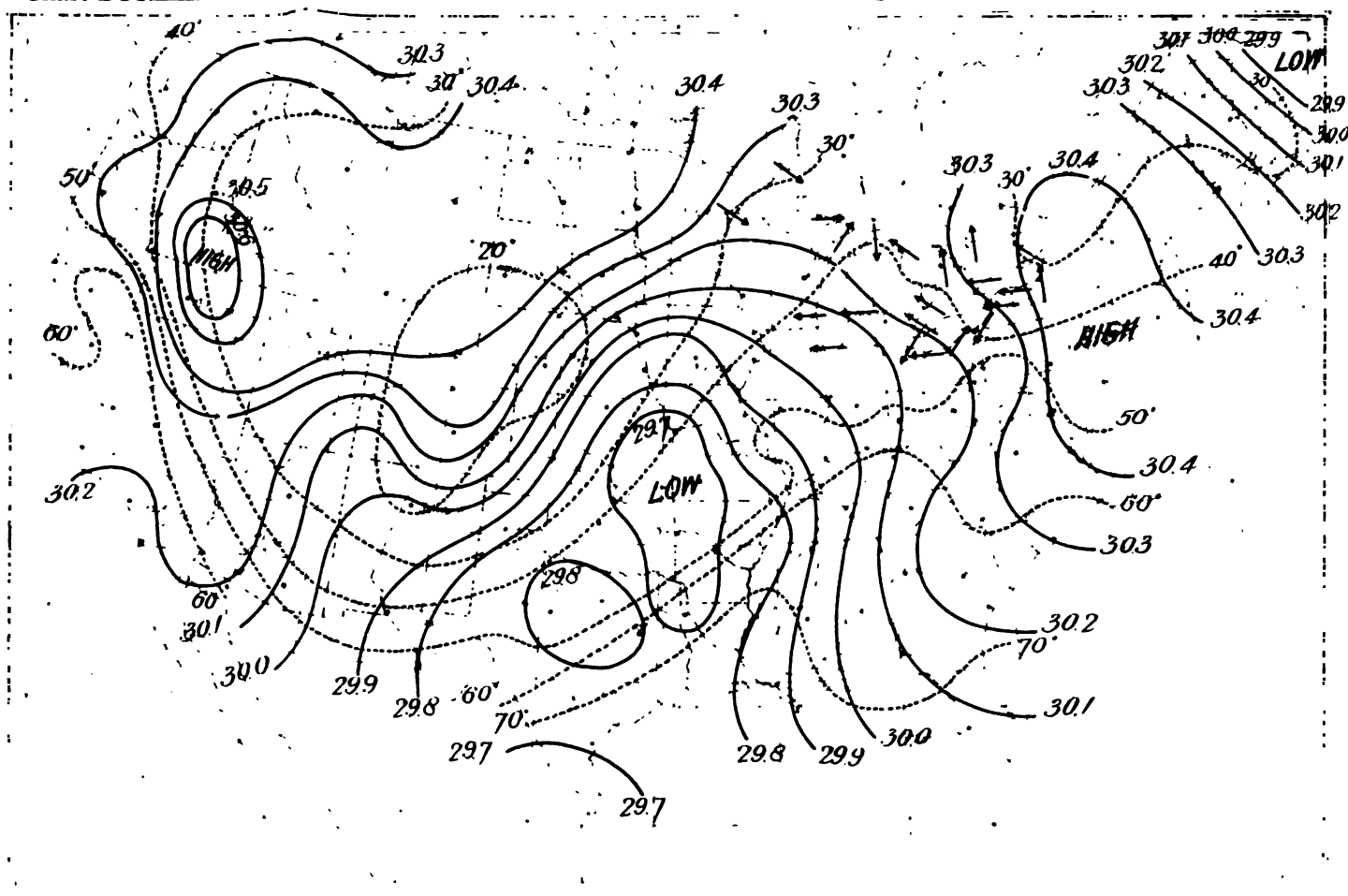


Chart DCCXXII.

November 17, 1886—7 a. m.

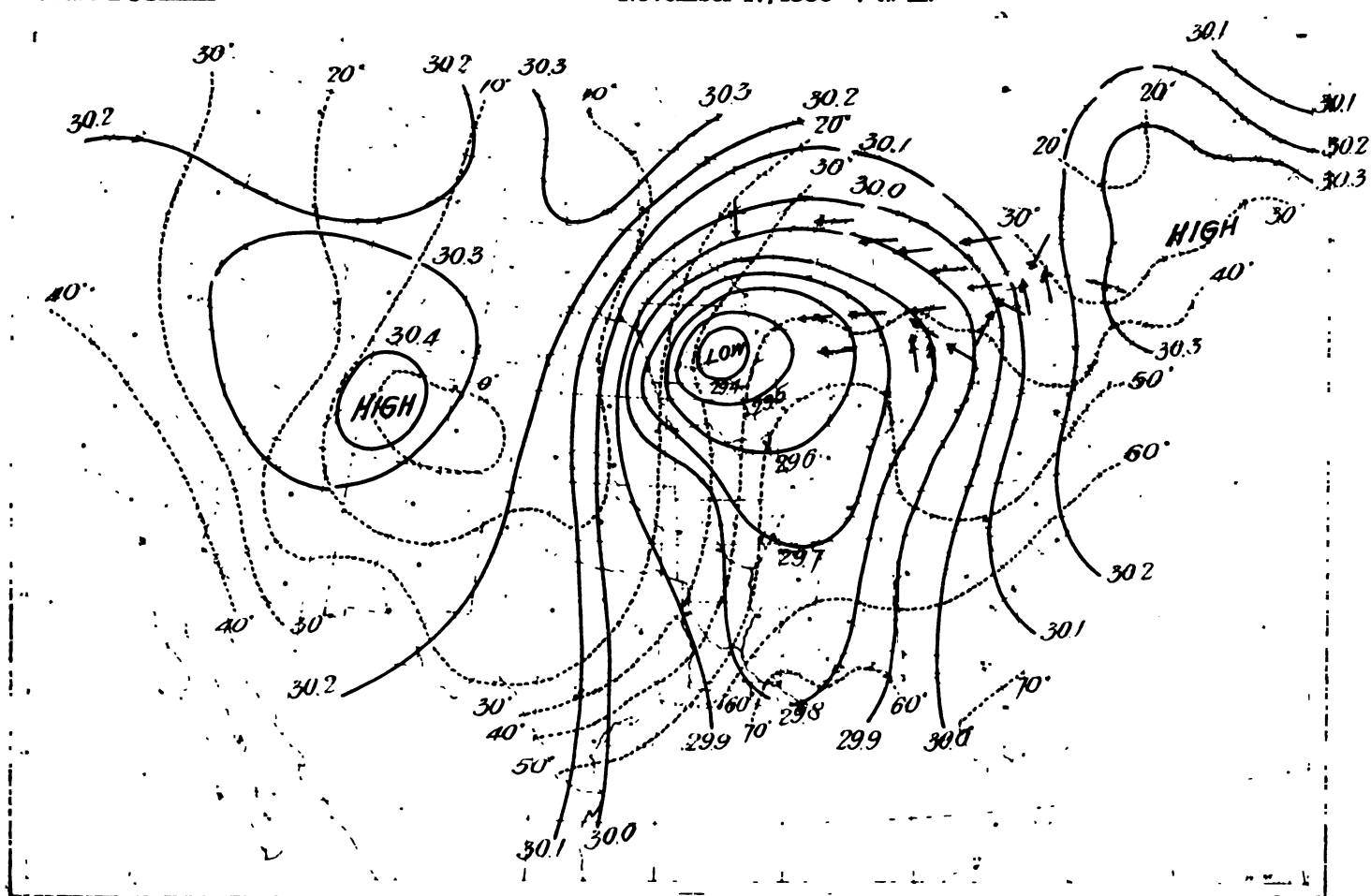


Chart DCCXXIII.

November 17, 1886—3 p. m.

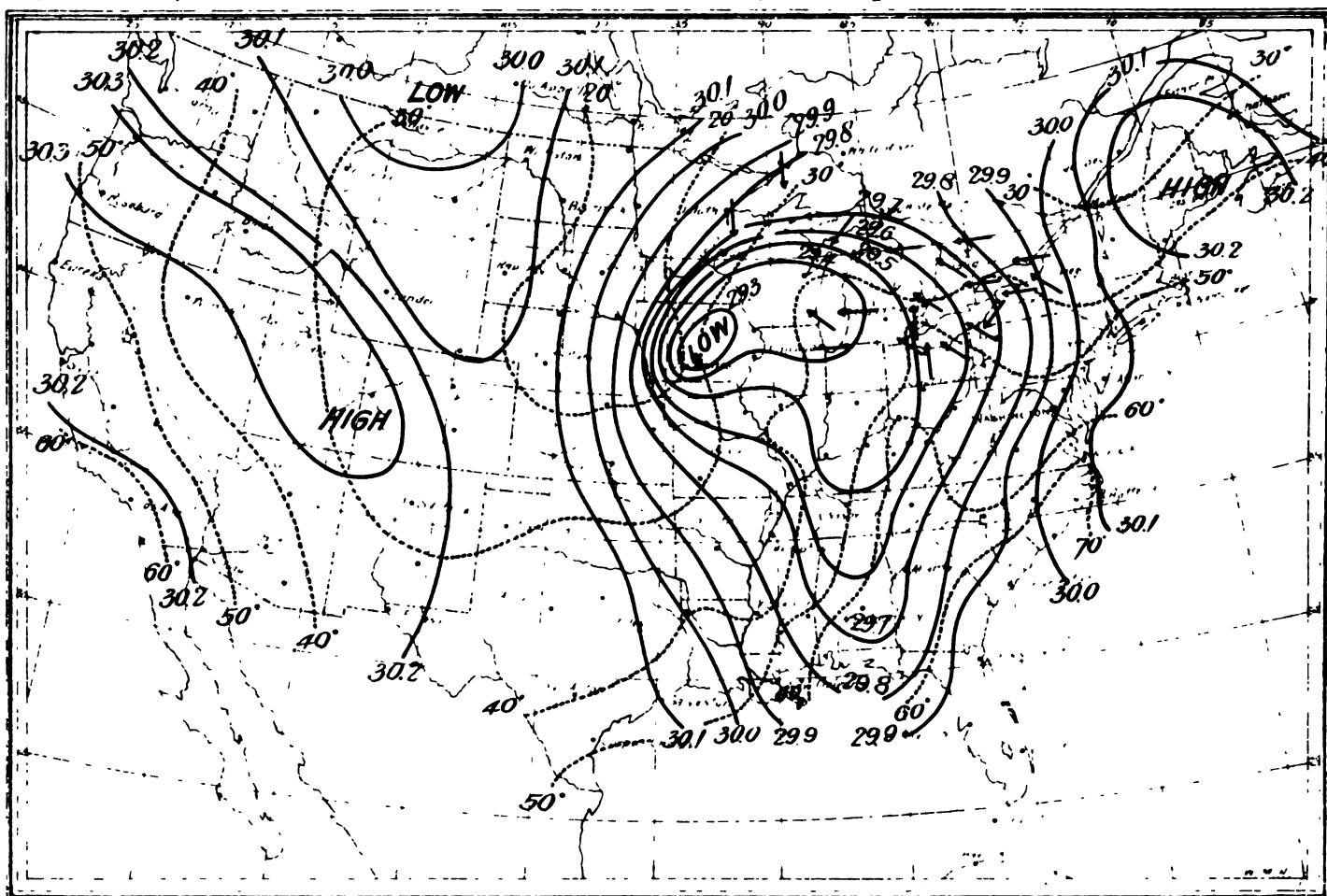
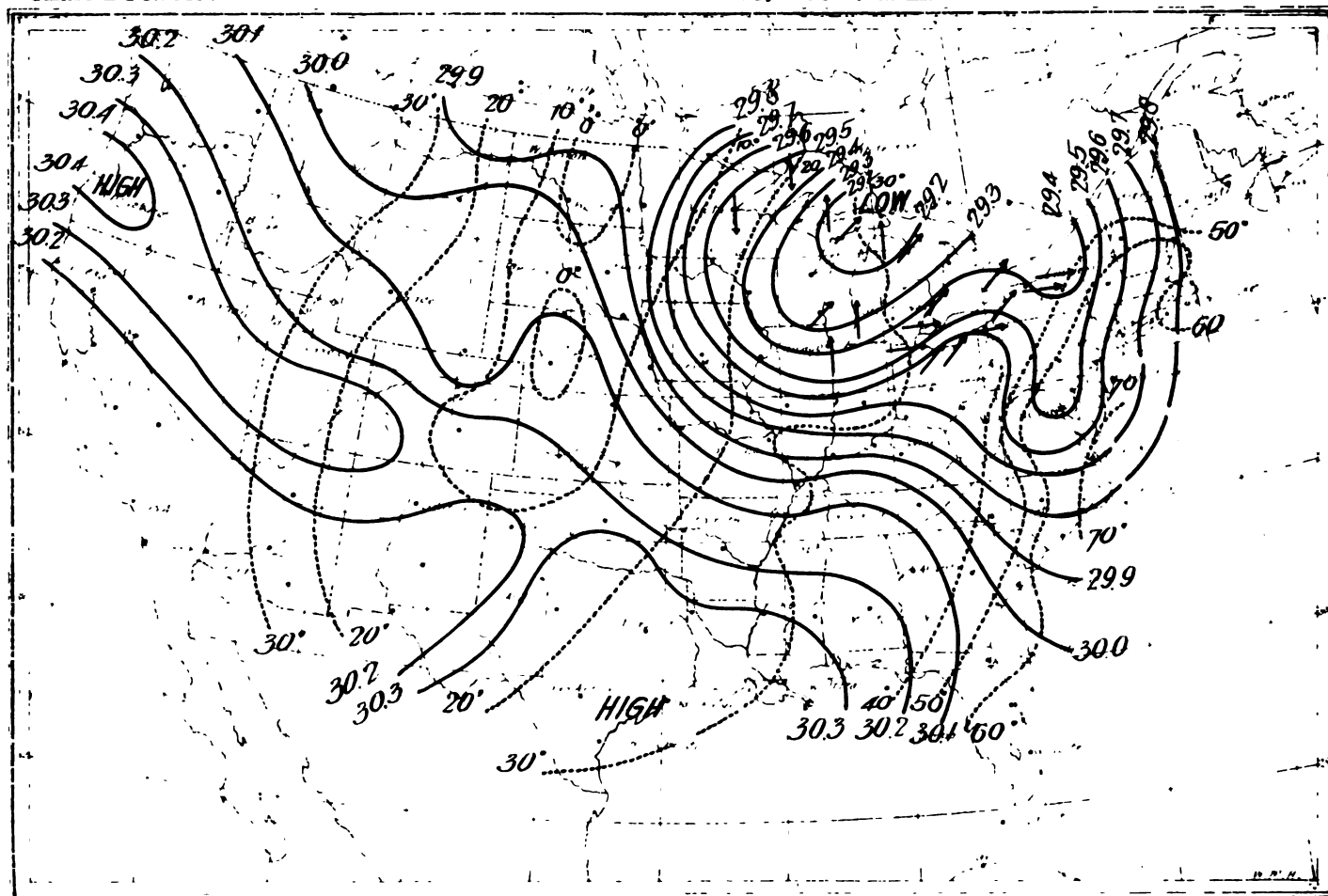


Chart DCCXXIV.

November 18, 1886—7 a. m.



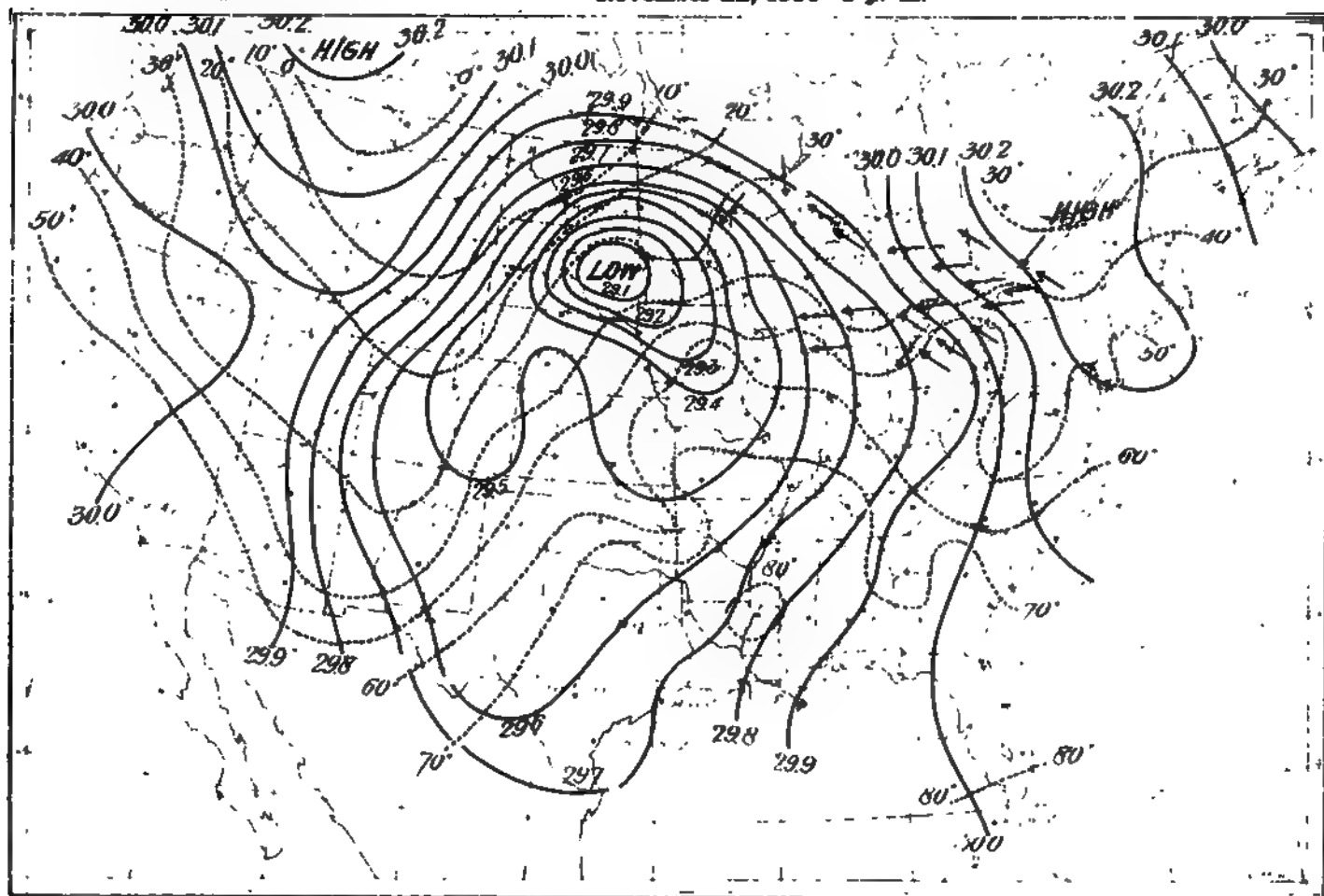
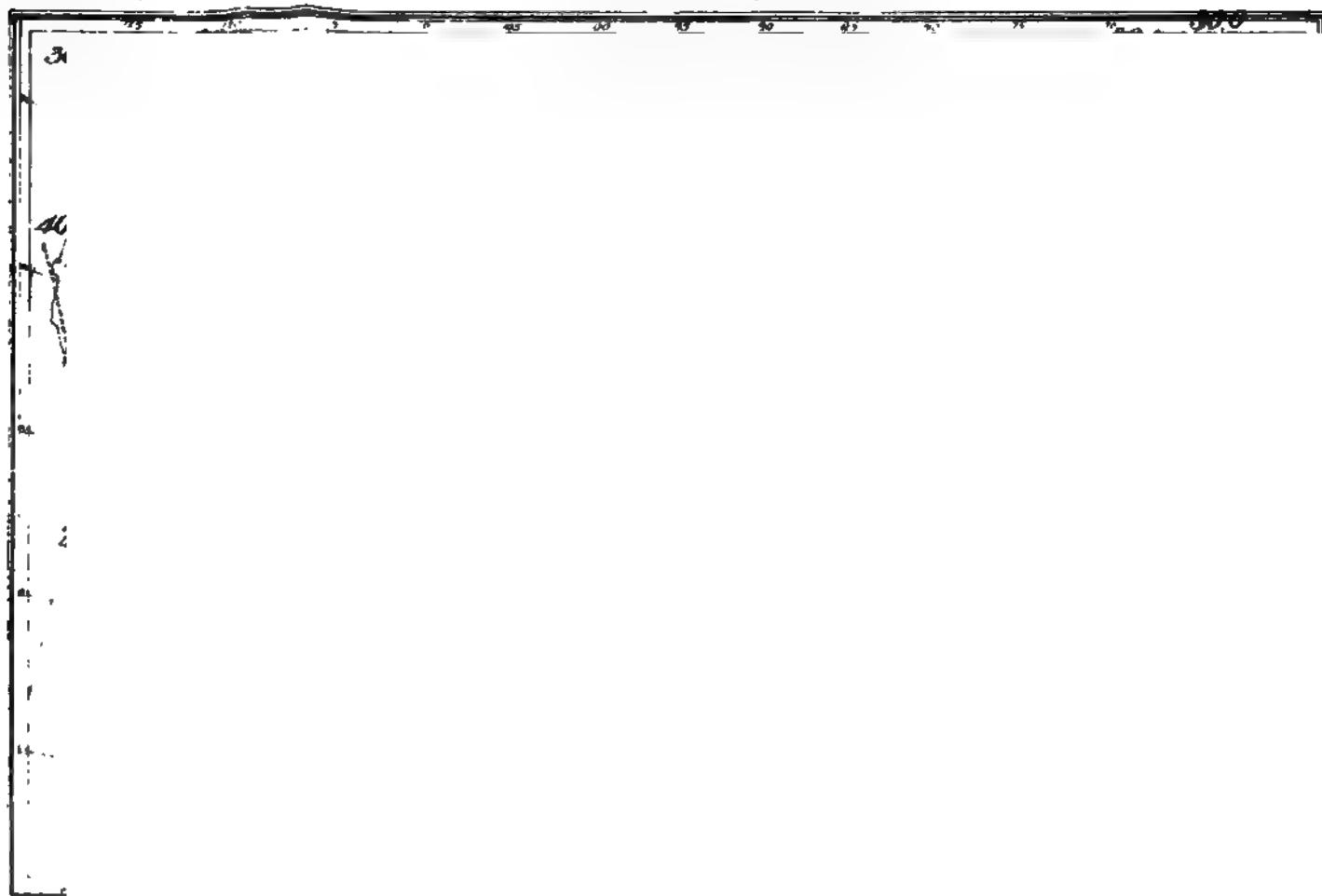


Chart DOOXXVII.

November 23, 1886—7 a. m.

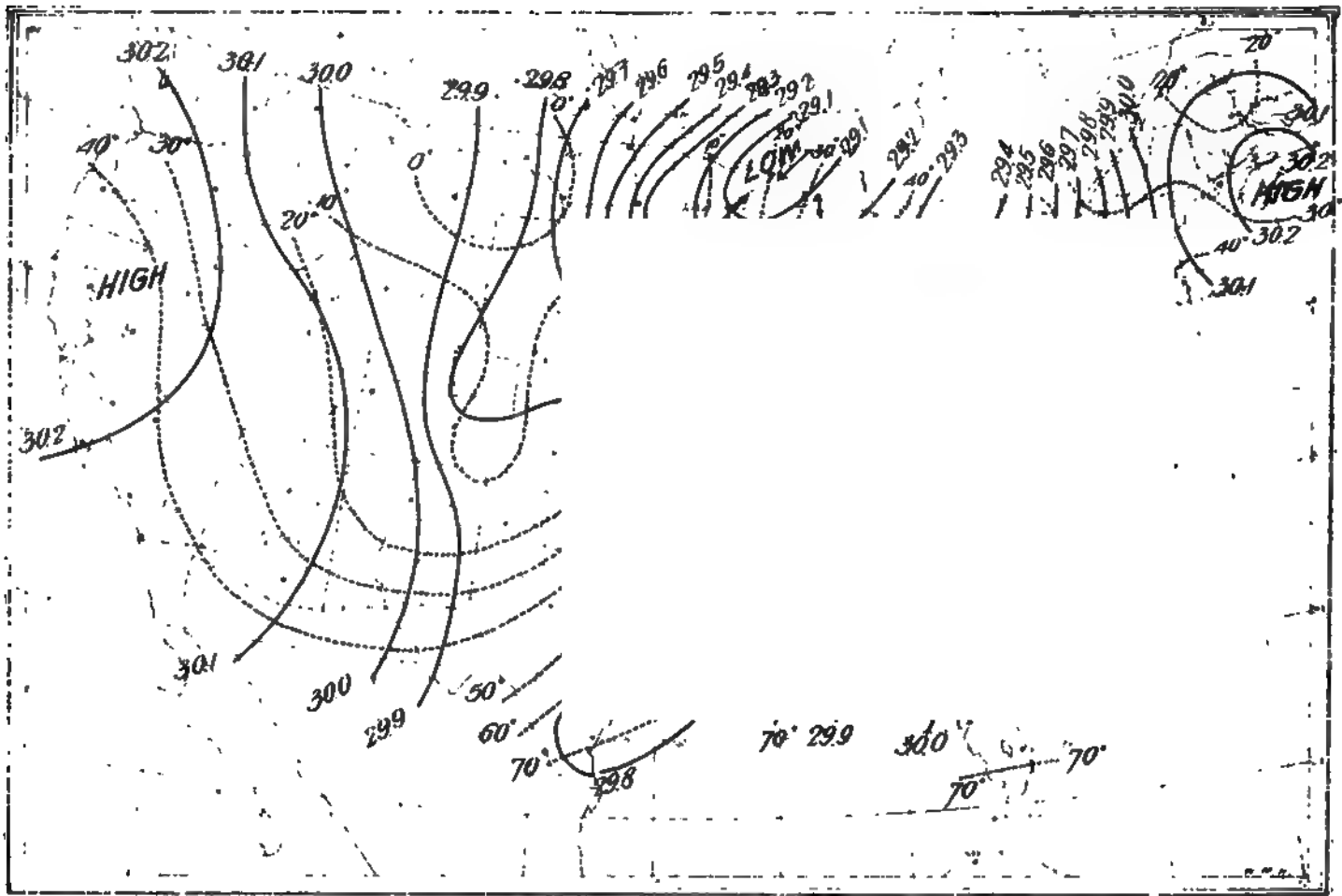


Chart DOOXXVIII.

November 23, 1886—3 p. m.

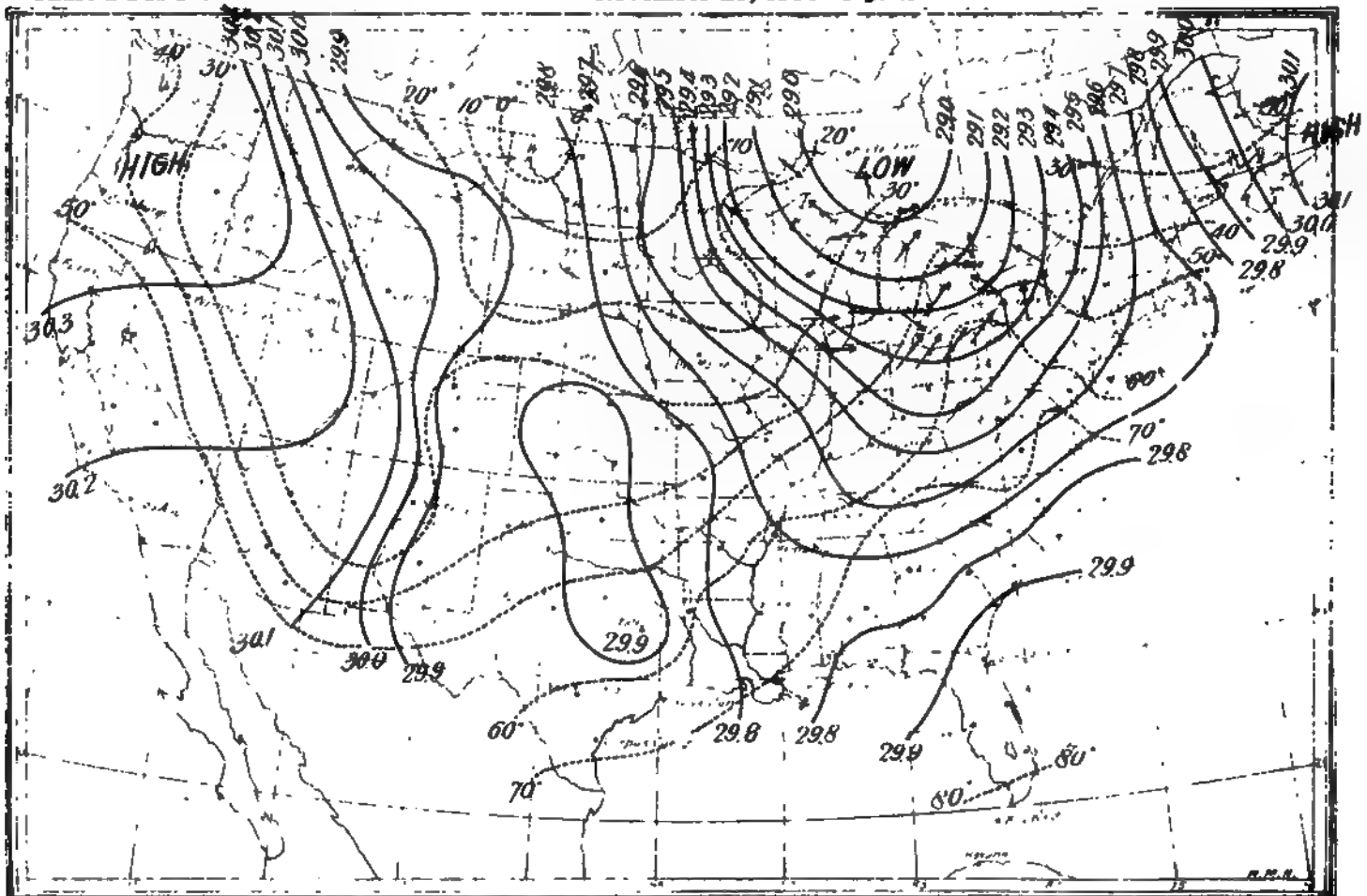


Chart D00XXIX.

November 18, 1887—7 a. m.

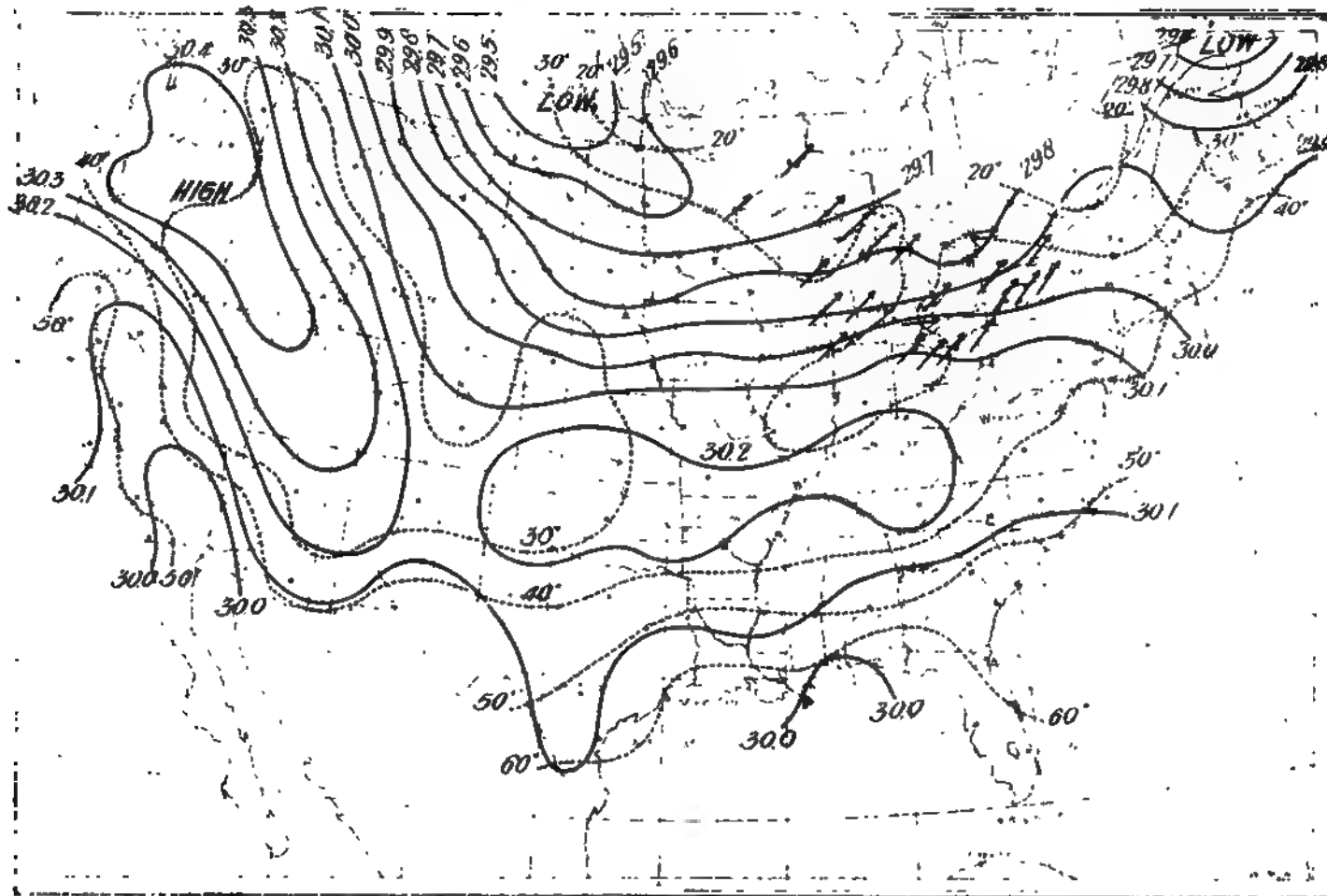
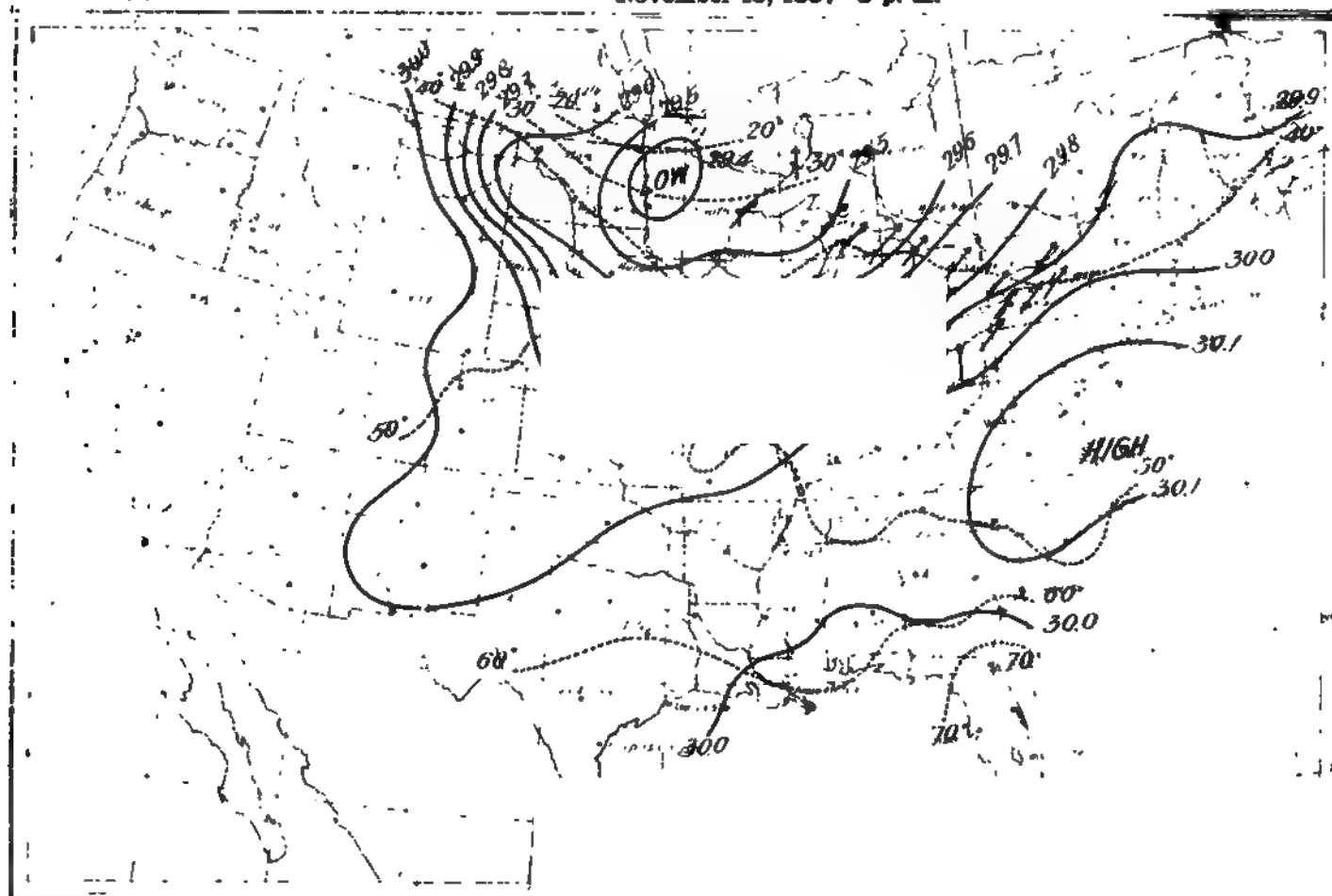


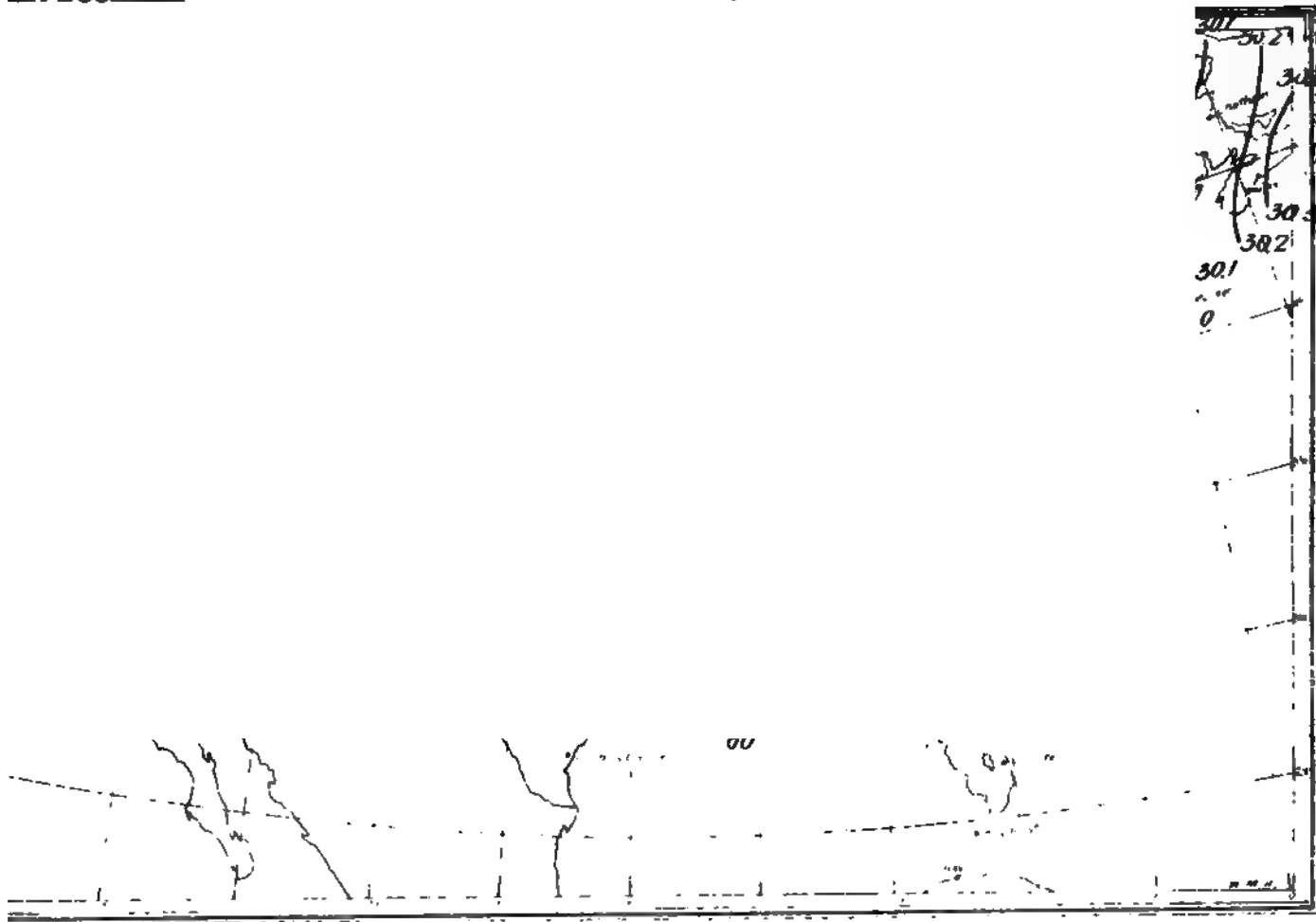
Chart D00XXX.

November 18, 1887—3 p. m.



hart DOOXXXI.

November 19, 1887-7 a. m.



hart DOOXXXII.

November 19, 1887-3 p. m.

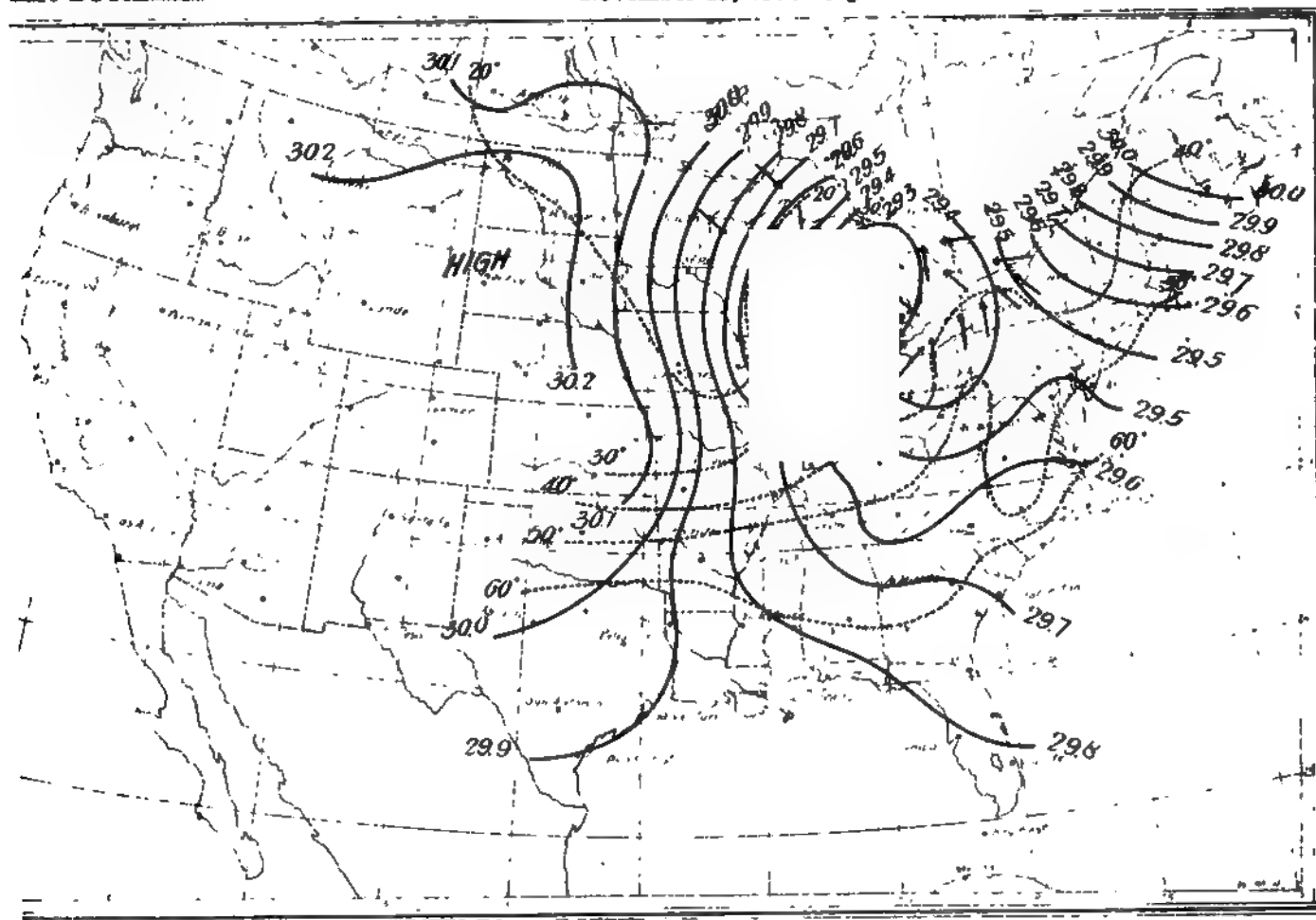


Chart D00XXXIII.

November 26, 1889—8 a. m.

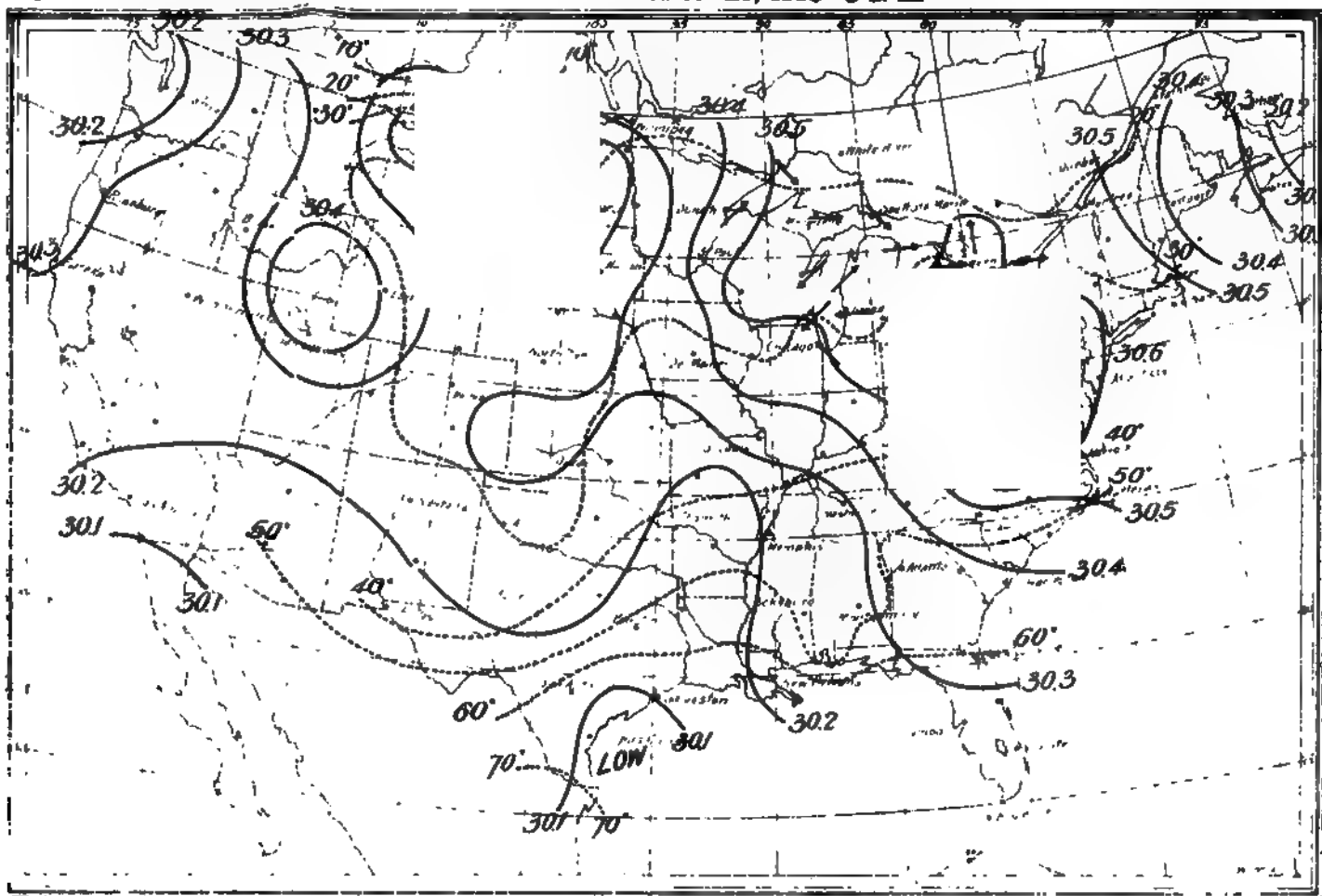


Chart D00XXXIV.

November 26, 1889—8 p. m.



Chart DCCXXXV.

November 27, 1889—8 a. m.

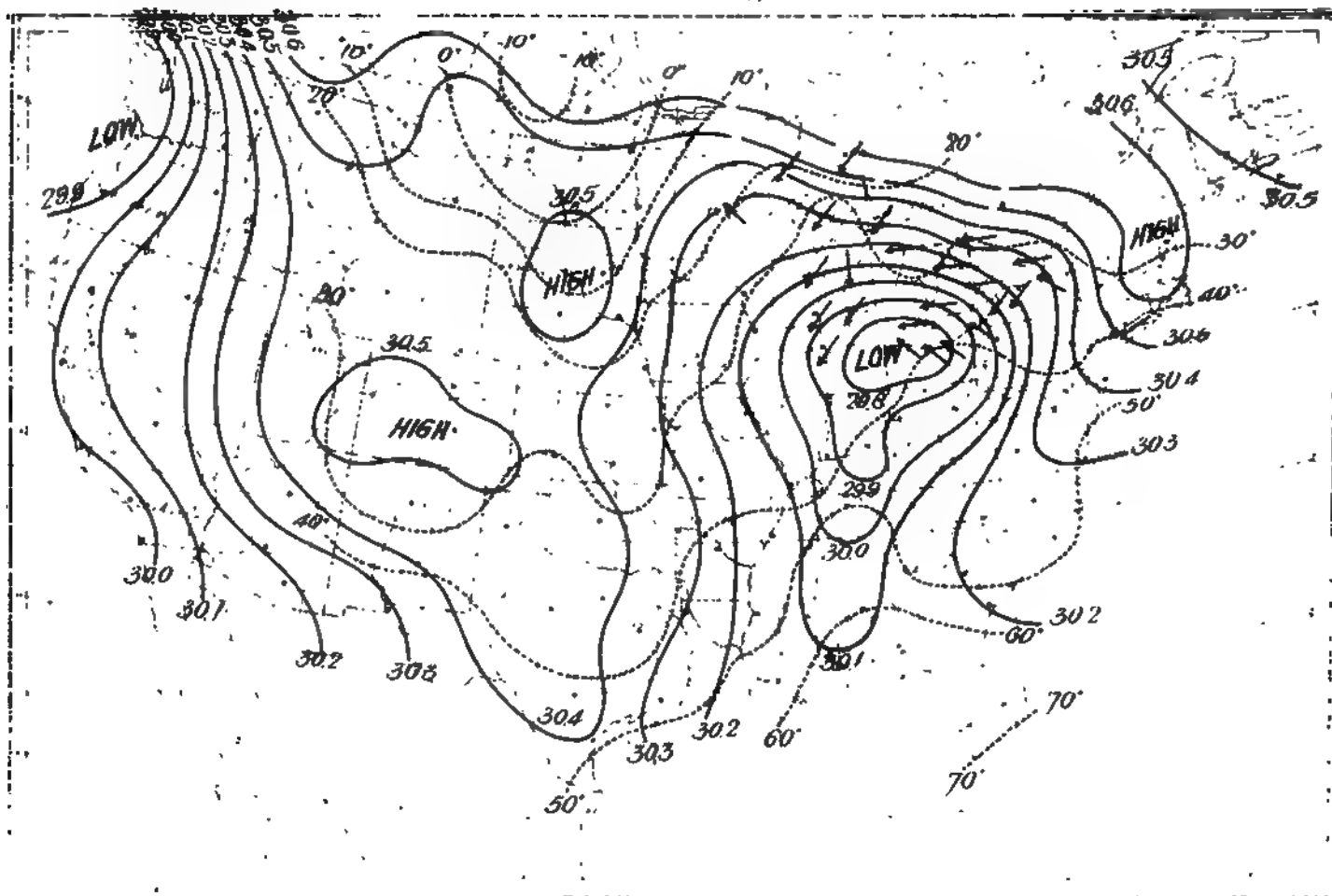


Chart DCCXXXVI.

November 27, 1889—8 p. m.

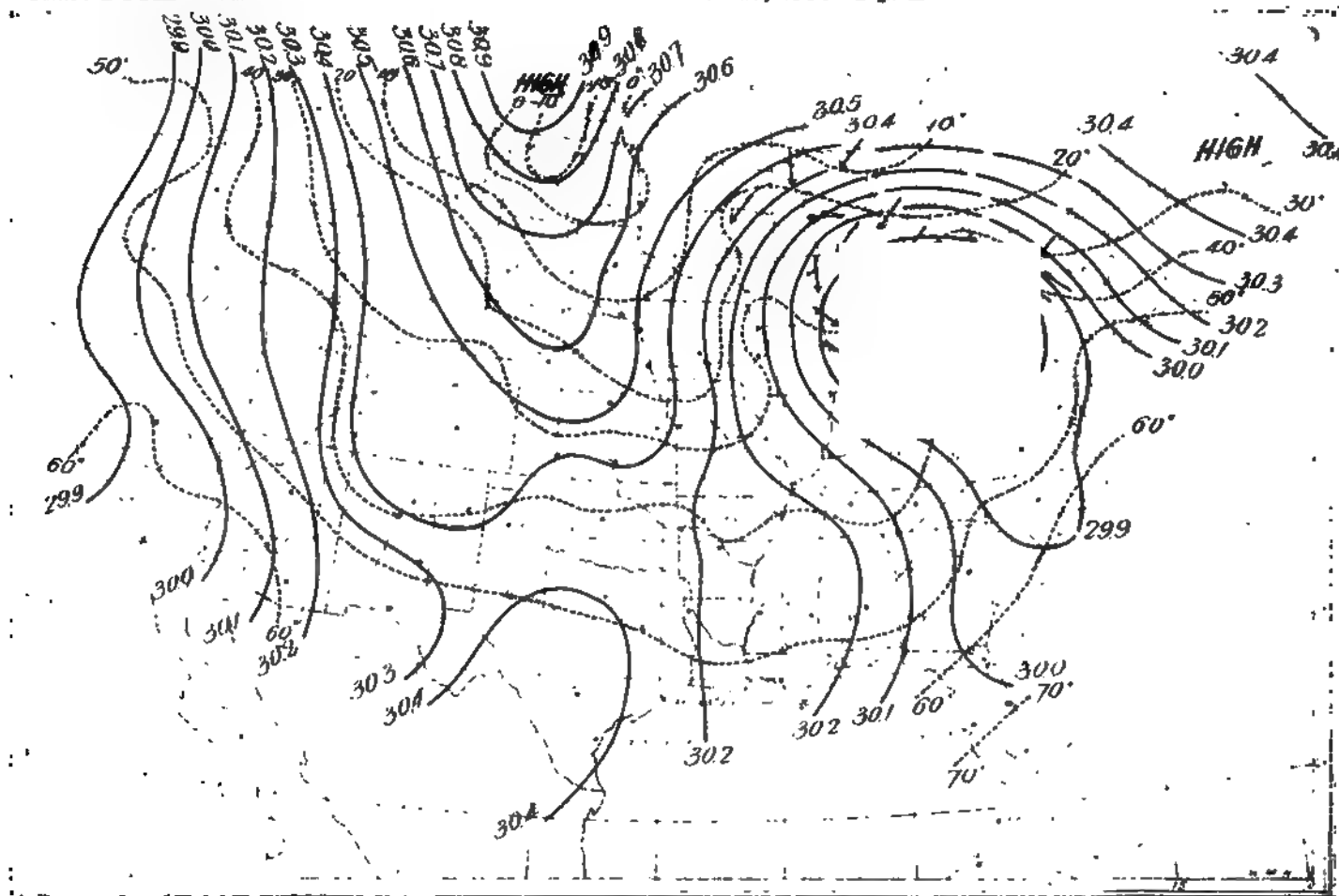


Chart DCOXXXVII.

November 10, 1891—8 a. m.

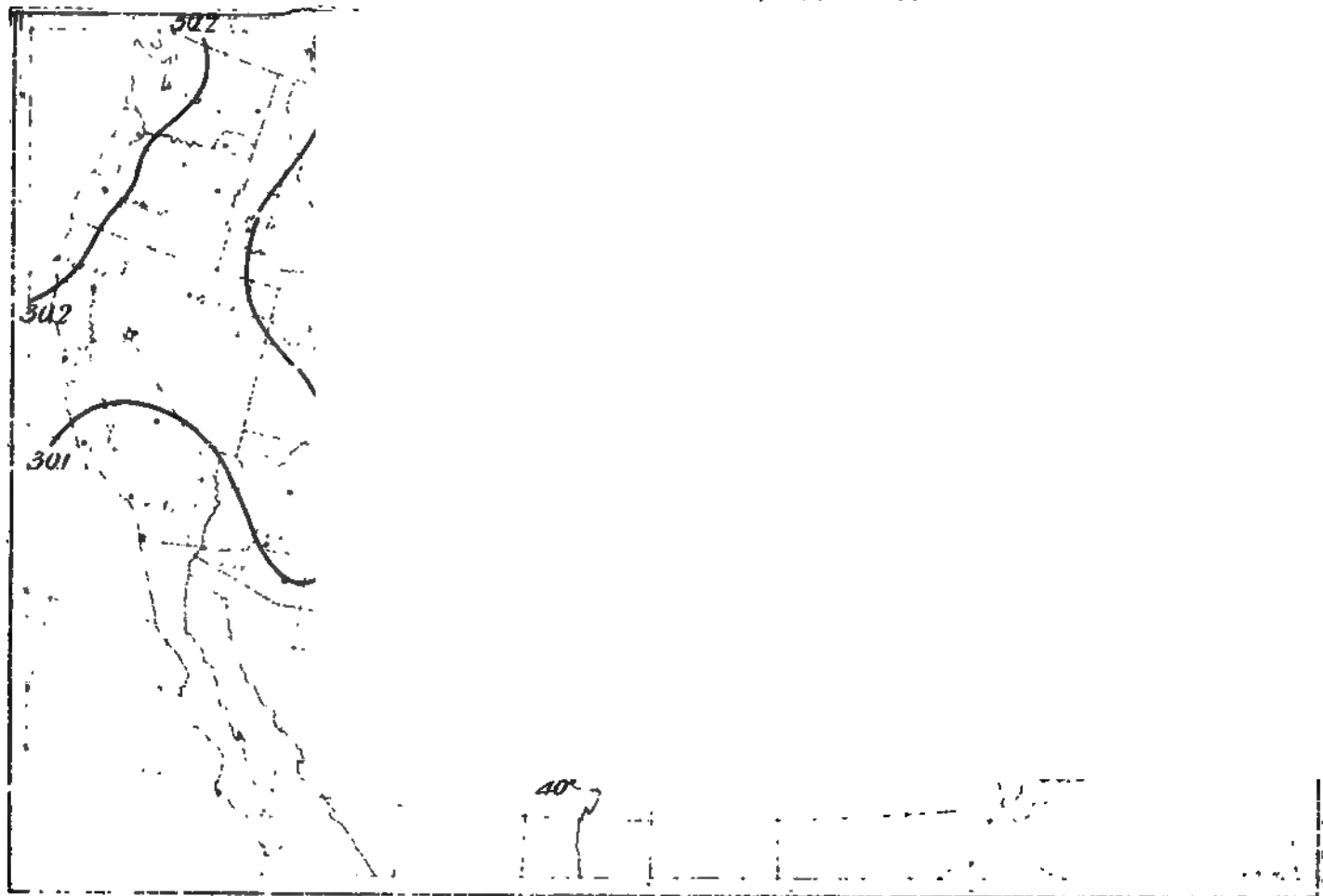


Chart DCOXXXVIII.

November 10, 1891—8 p. m.

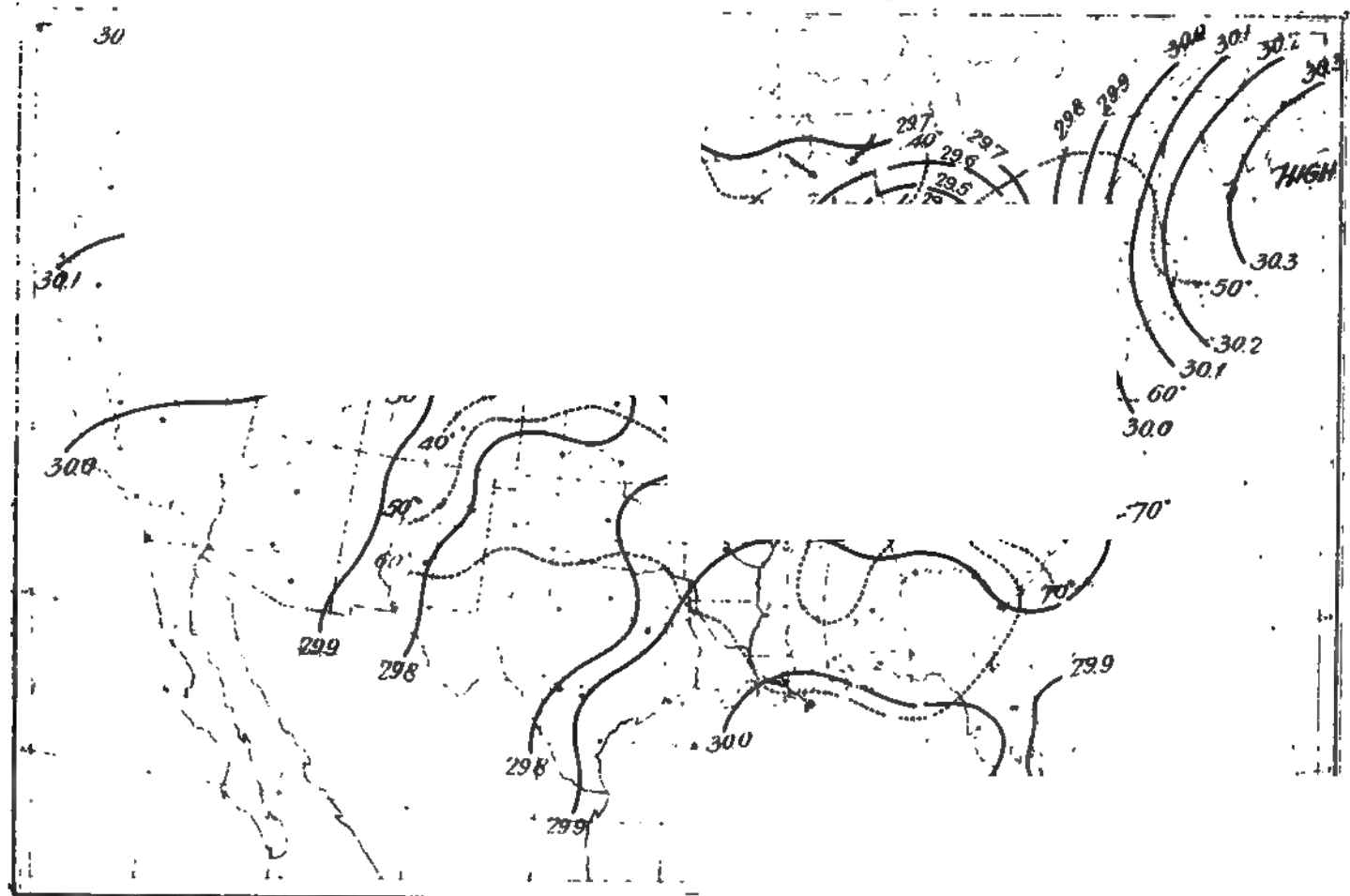


Chart DCOXXXIX.

November 11, 1891—8 a. m.

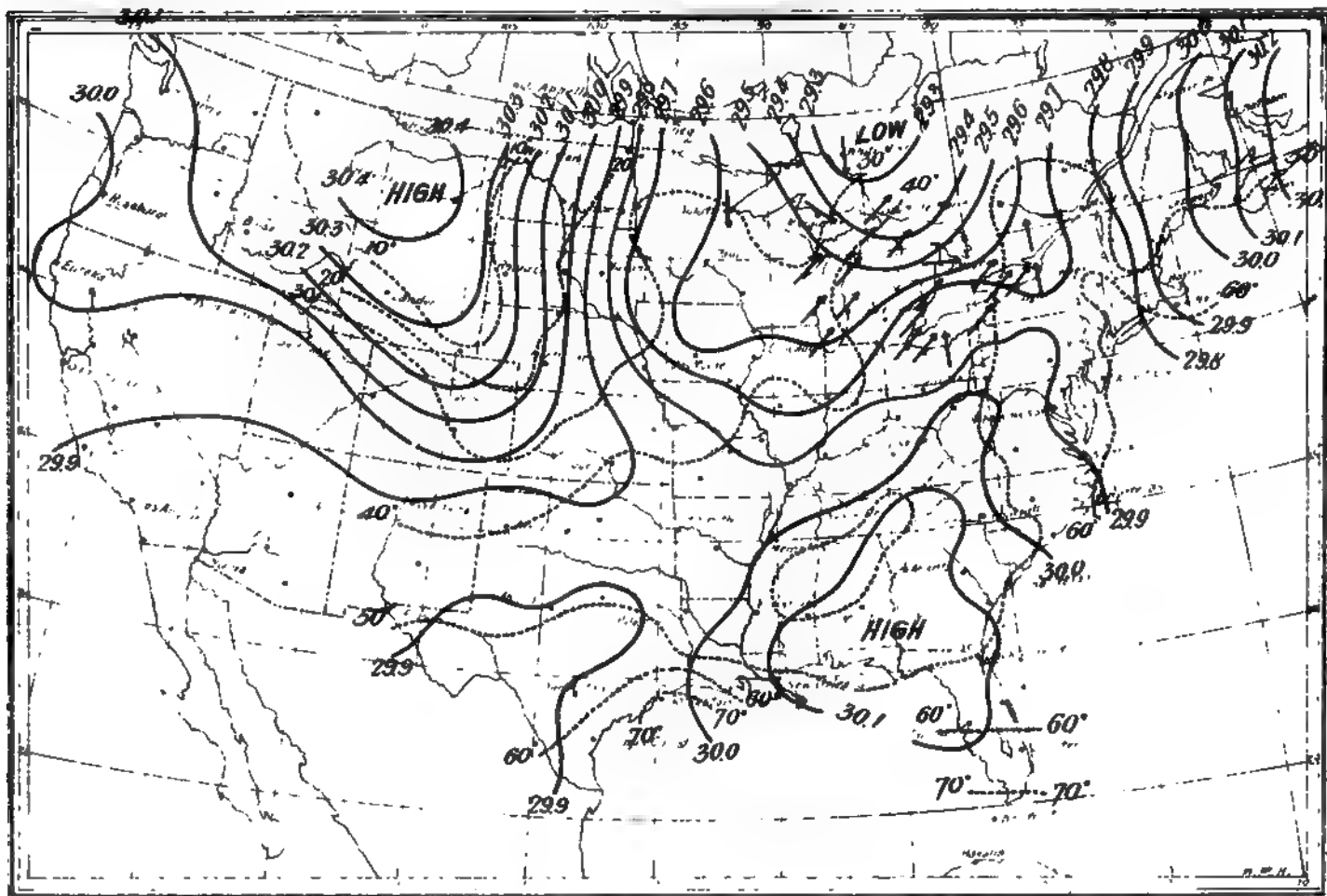


Chart DCOXXL.

November 11, 1891—8 p. m.

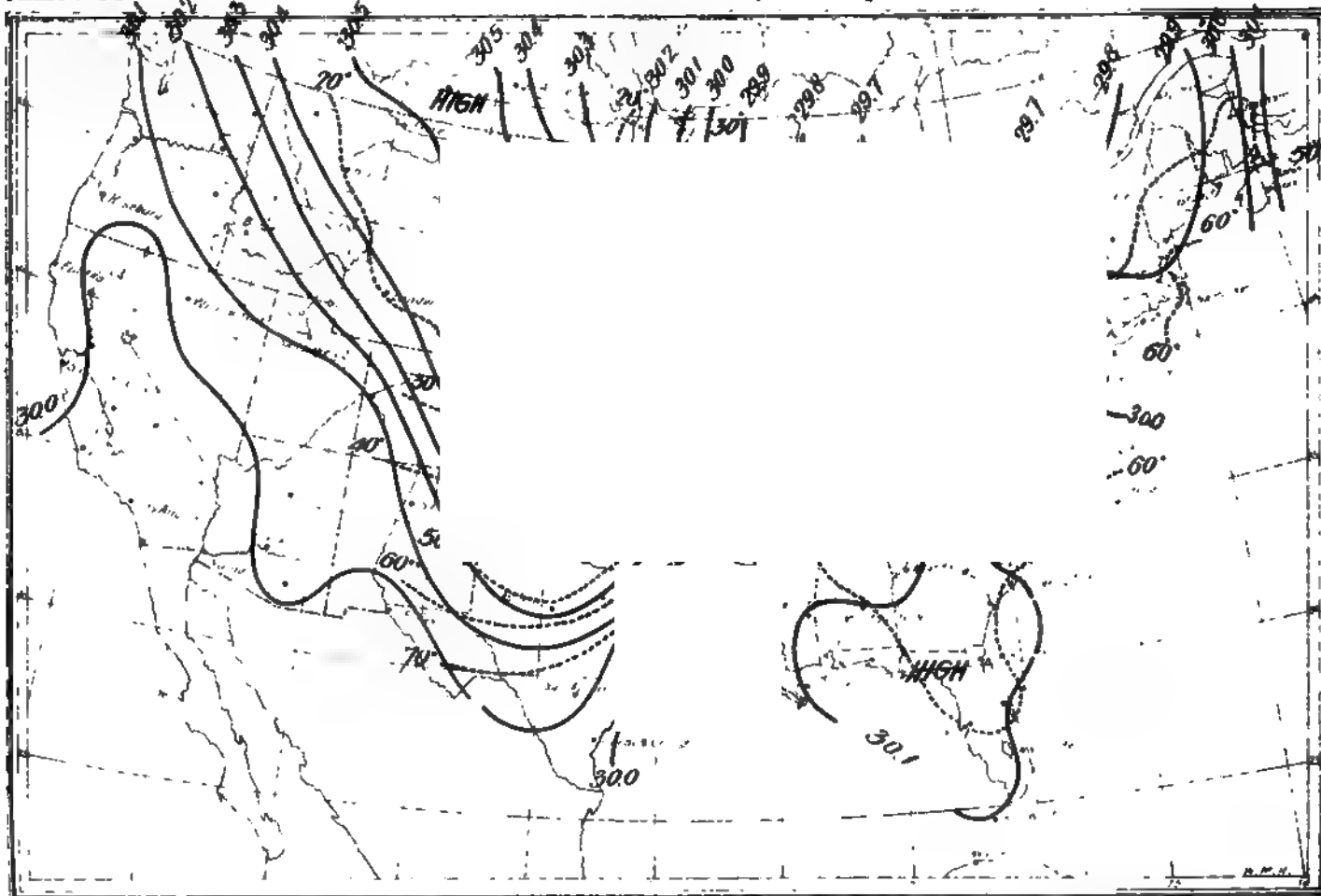


Chart DOCKLI.

November 15, 1891—8 a. m.

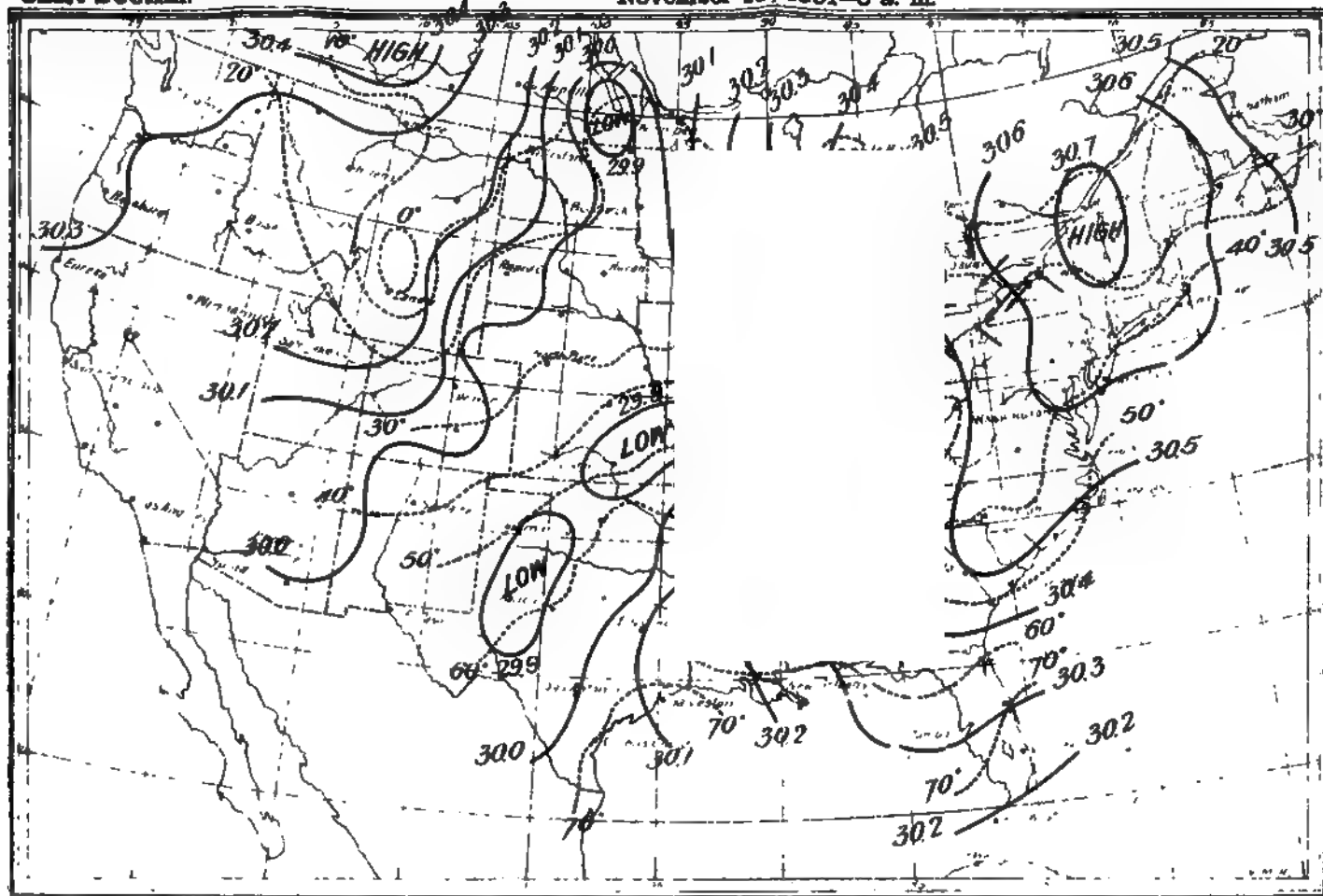
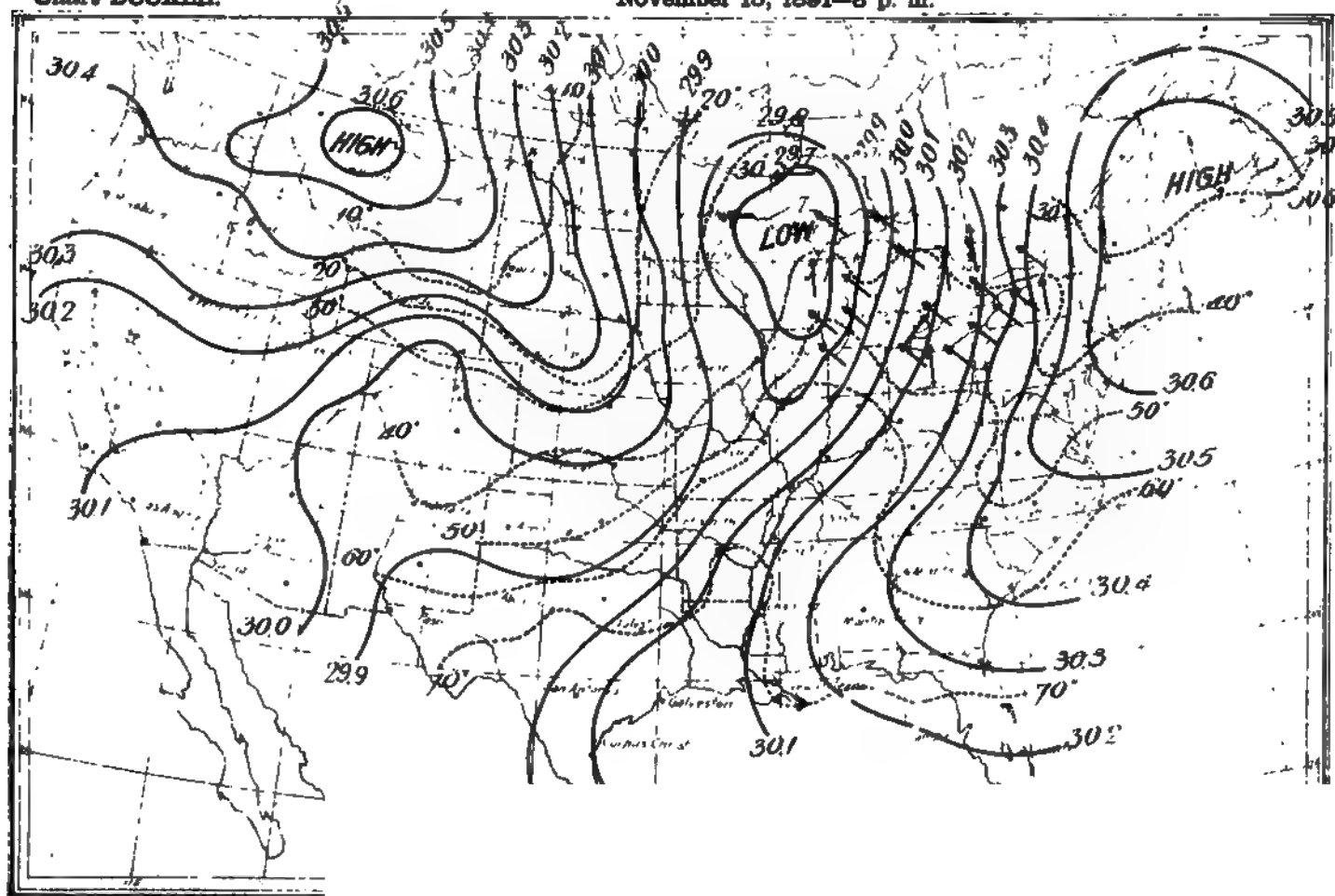


Chart DOCKLI.

November 15, 1891—8 p. m.



November 10, 1891—8 a. m.



Part DCCXLIV.

November 16, 1891—8 p. m.

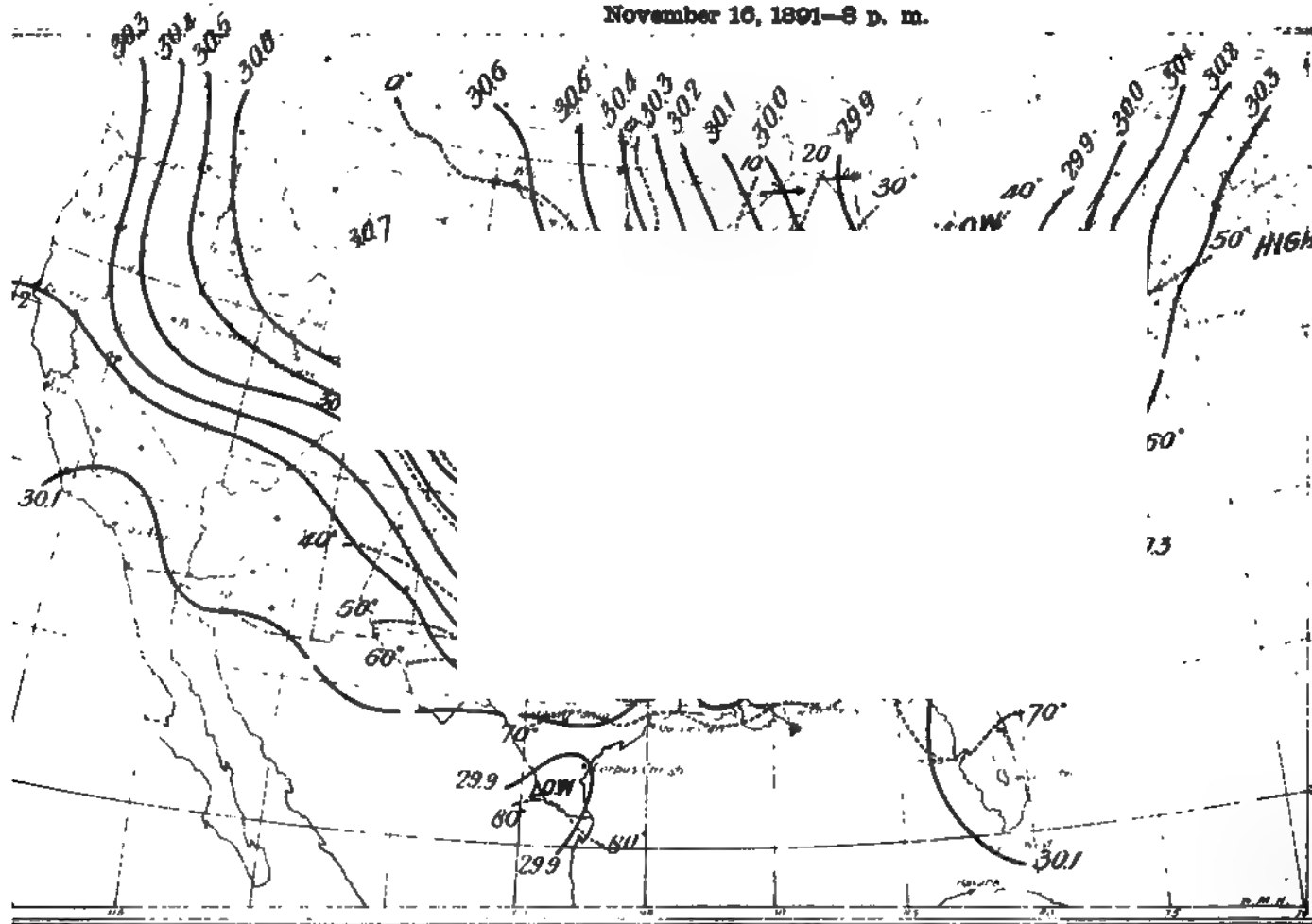


Chart DOCKLV.

November 20, 1891—8 a. m.

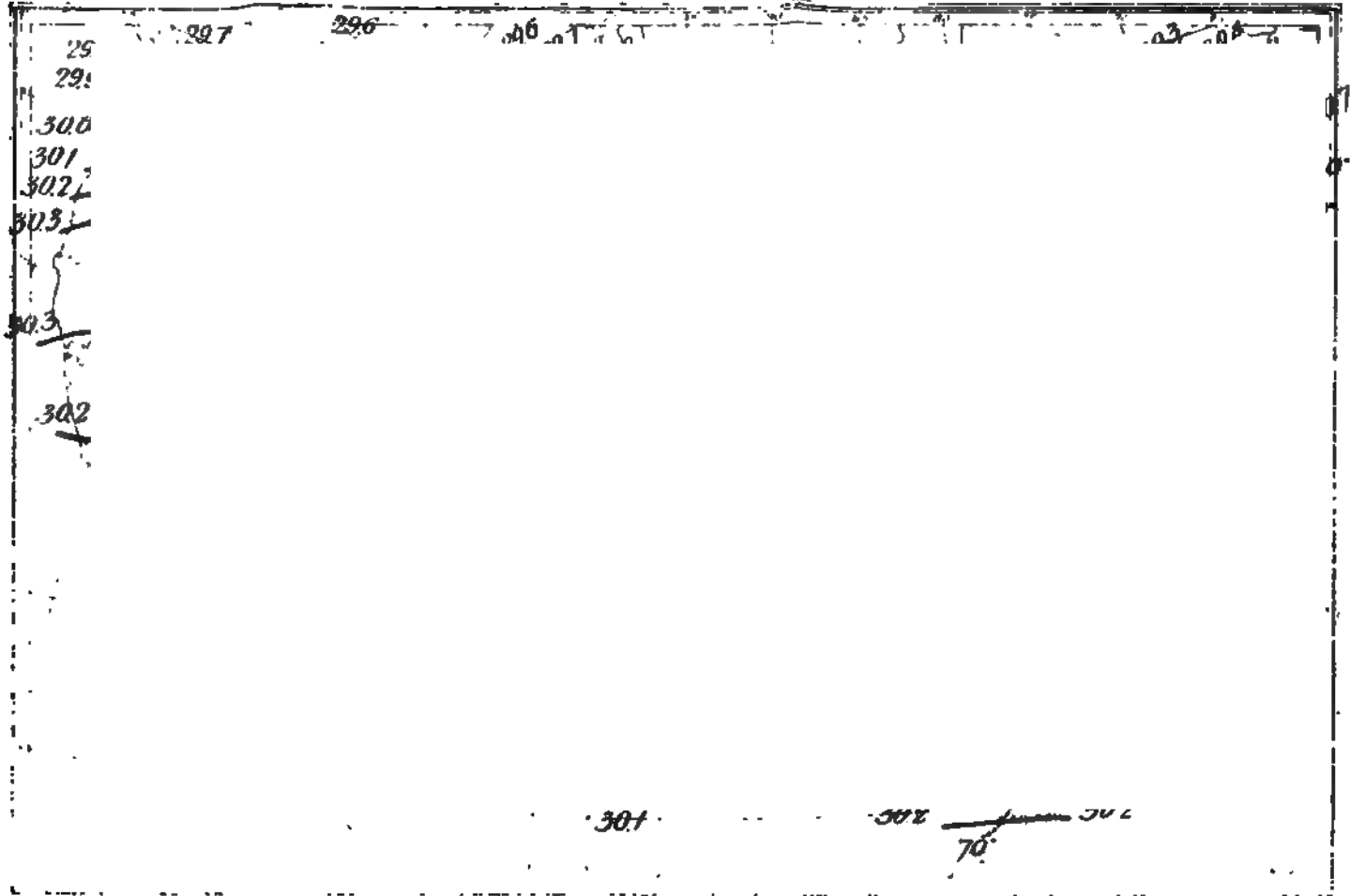


Chart DOCKLVI.

November 20, 1891—8 p. m.

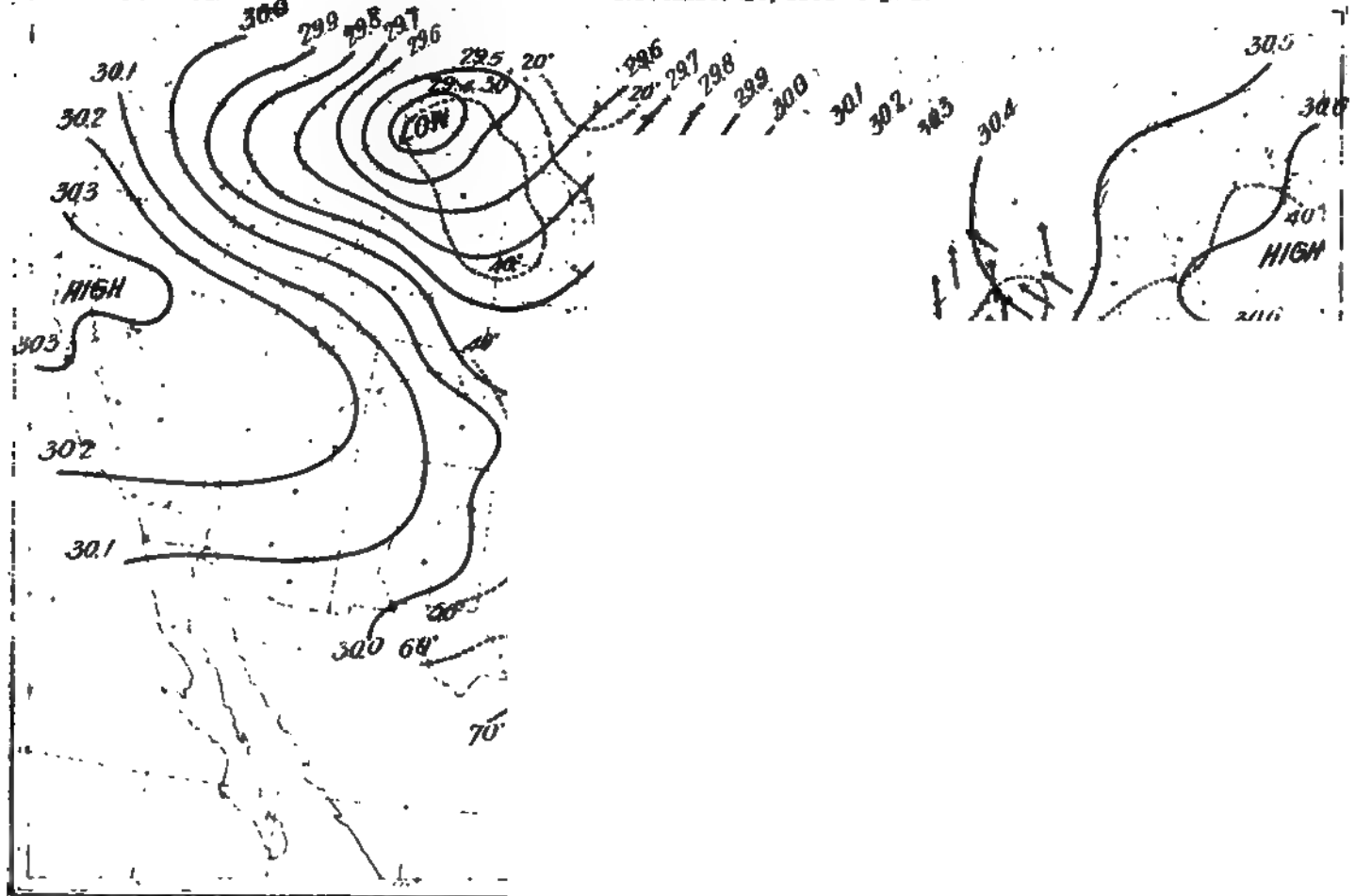


Chart DOOXLVII.

November 21, 1891—8 a. m.

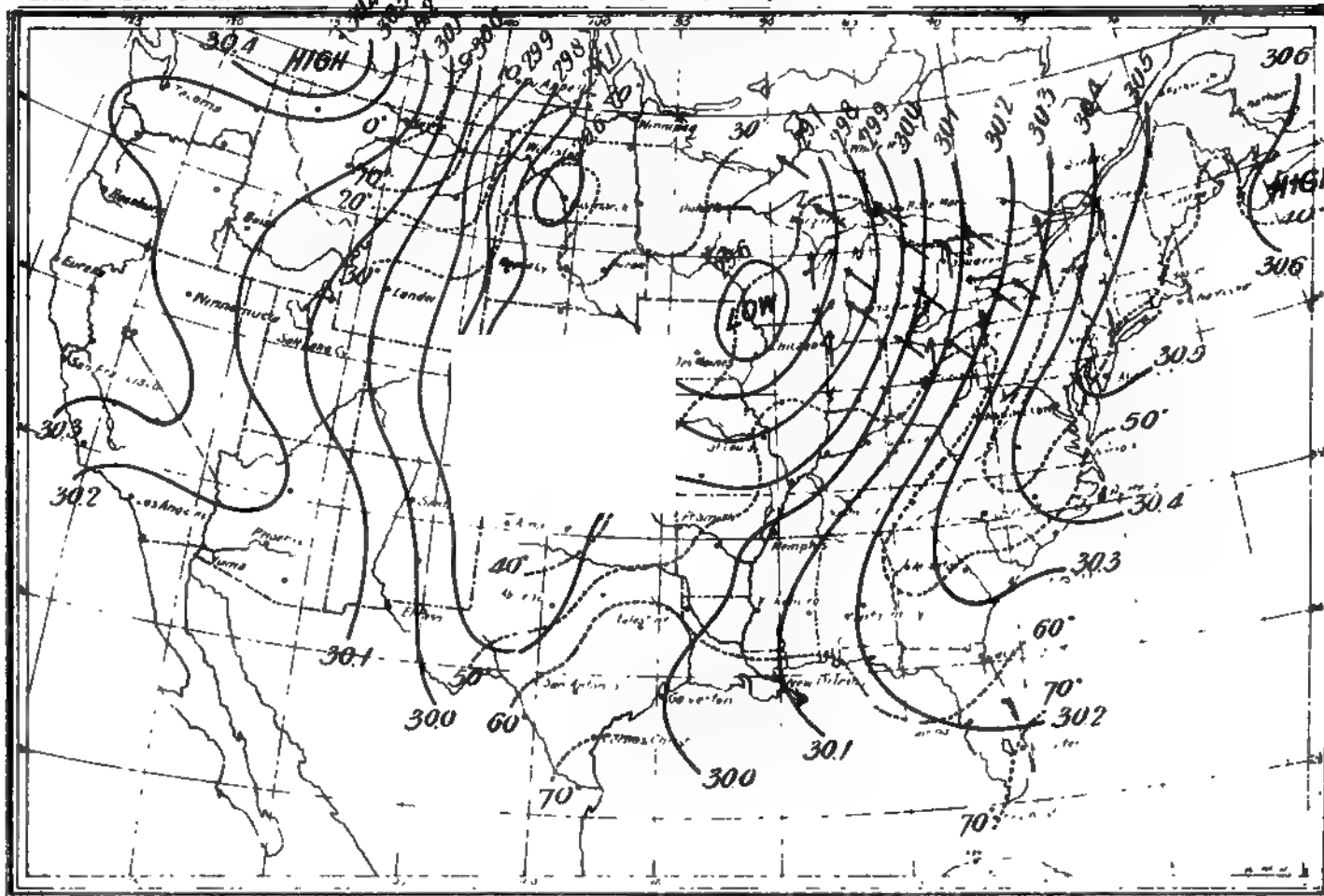


Chart DOOXLVIII.

November 21, 1891—8 p. m.

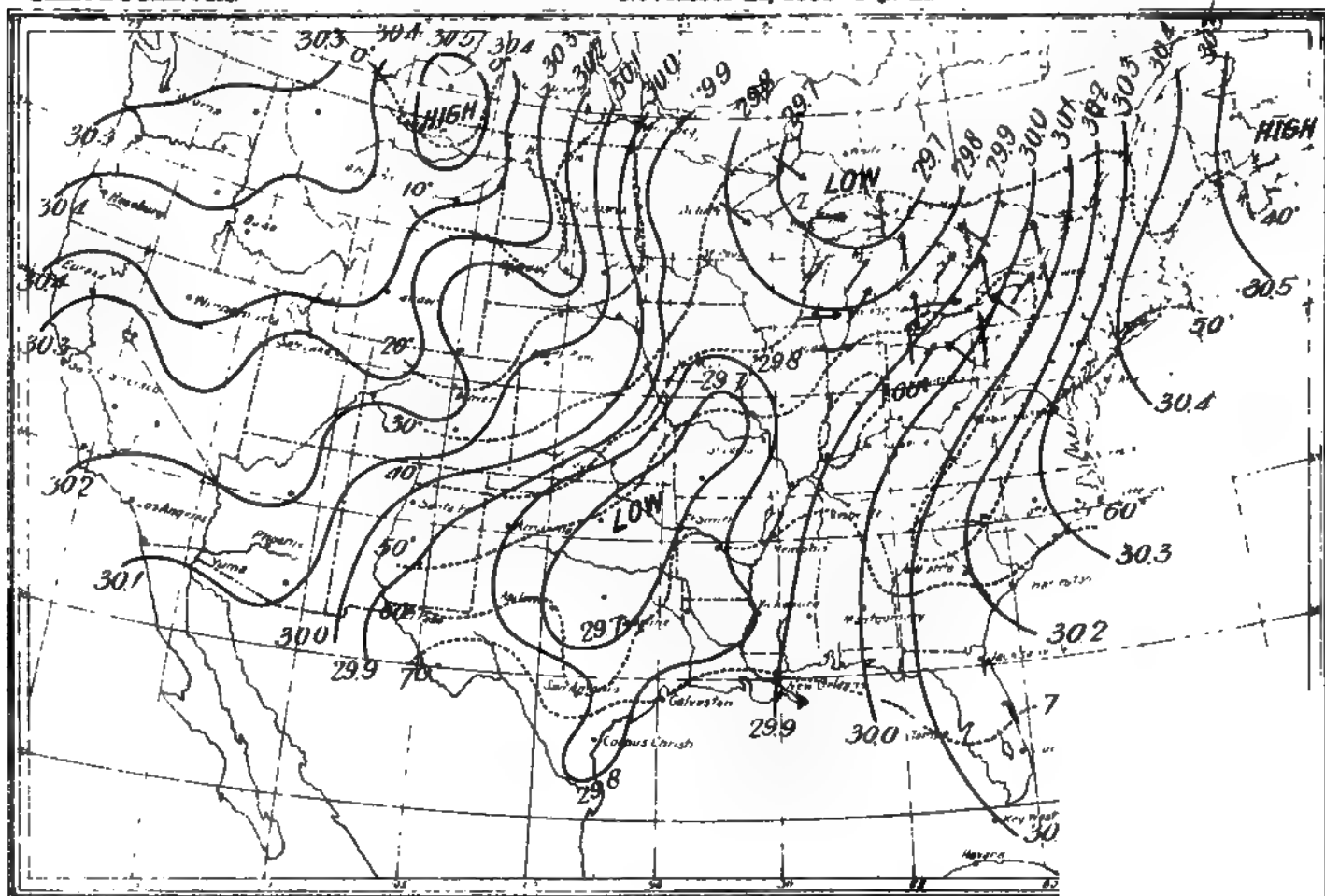


Chart DOOXLIX.

November 25, 1891—8 a. m.



Chart DOOL.

November 26, 1891—8 p. m.

A vertical line of text, possibly a page number or a reference, located on the left side of the page.

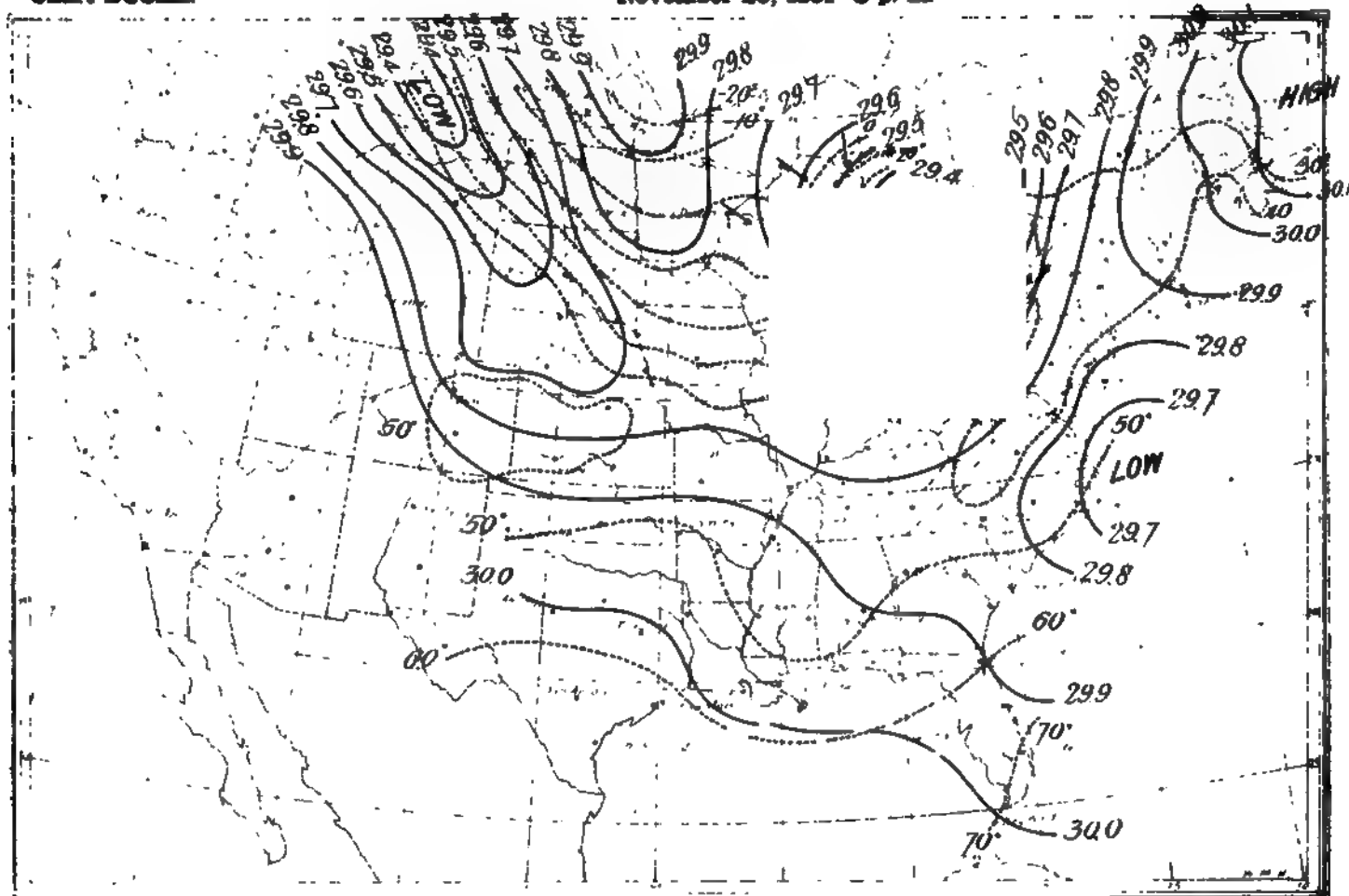
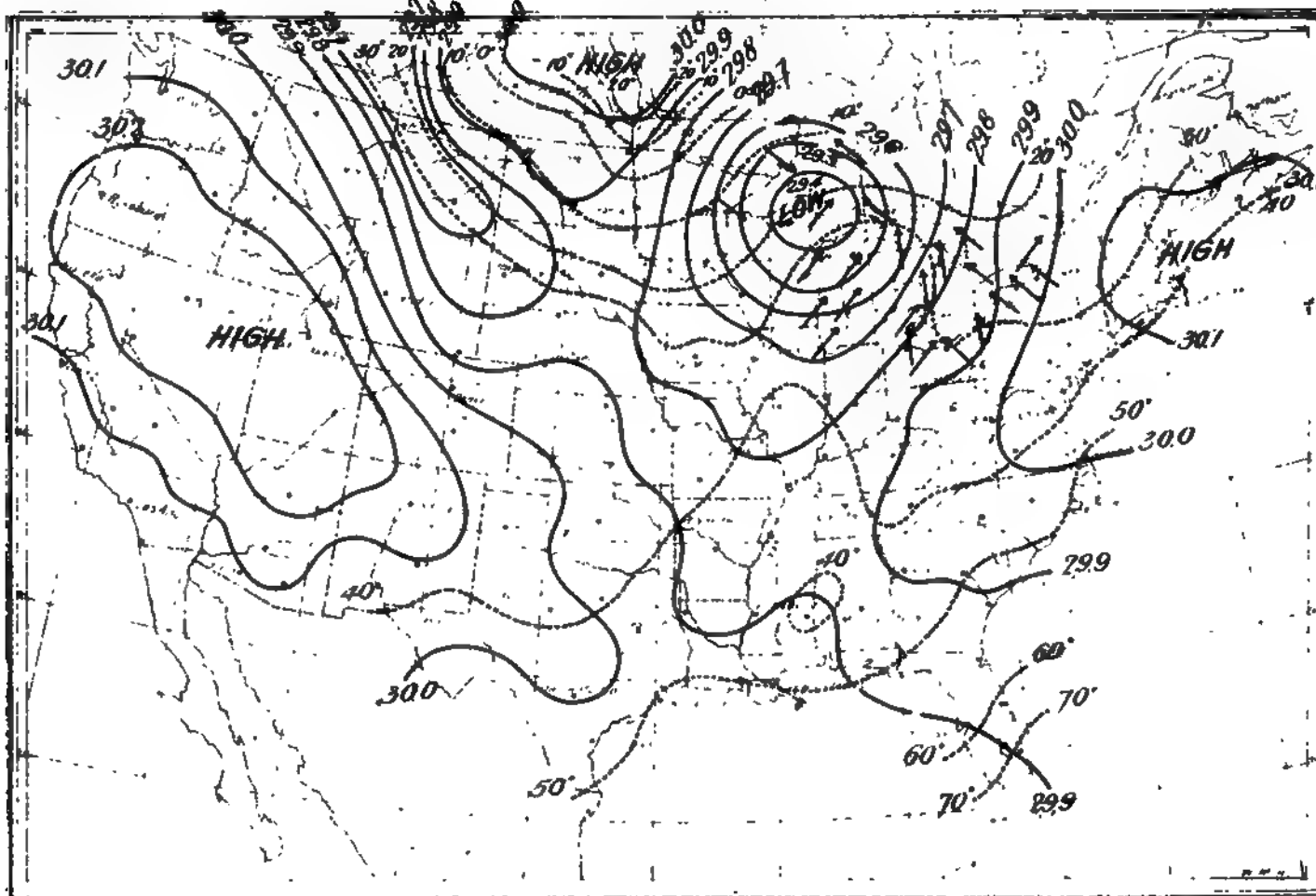


Chart DOOLIII.

November 6, 1892—8 a. m.

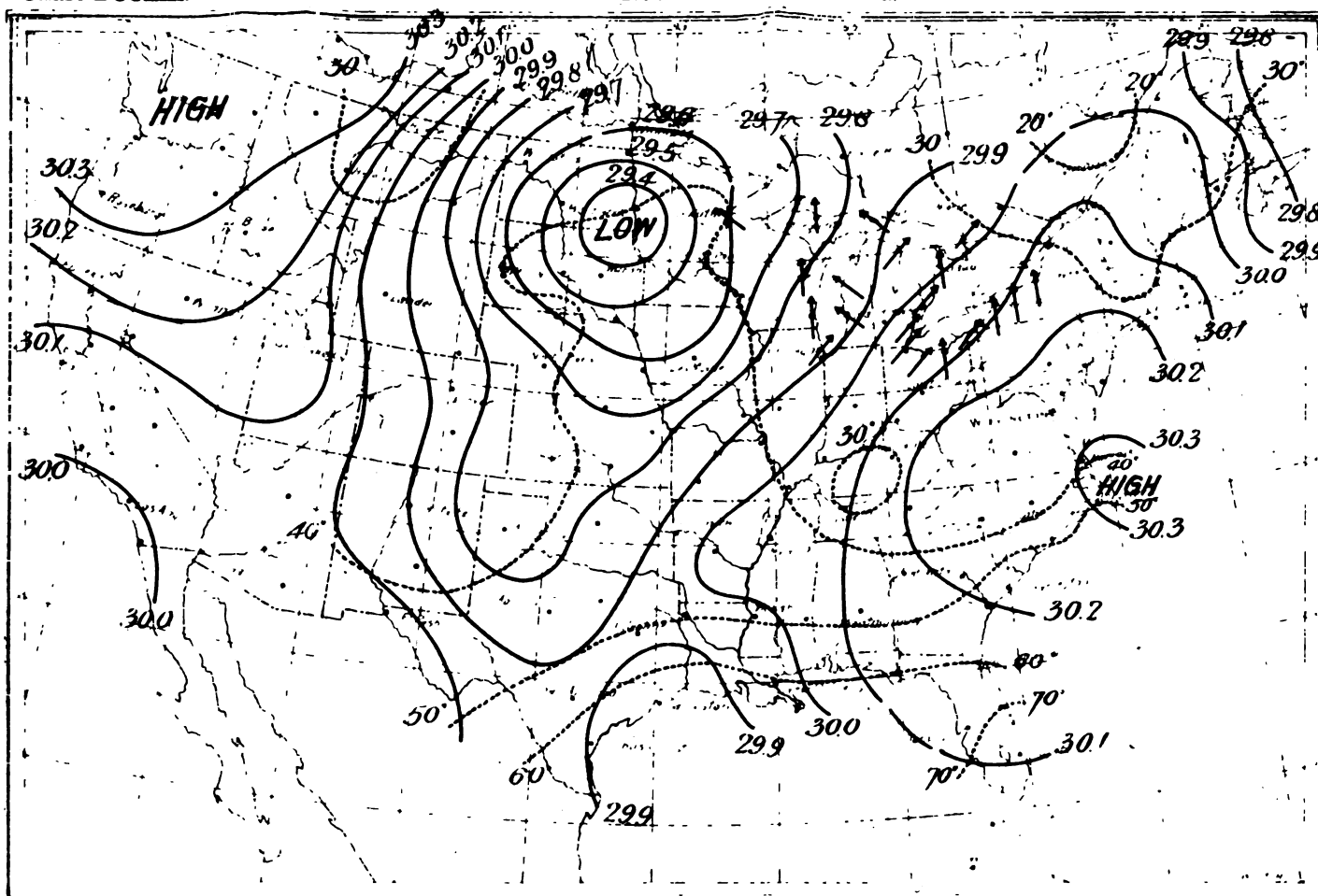


Chart DOOLIV.

November 6, 1892—8 p. m.

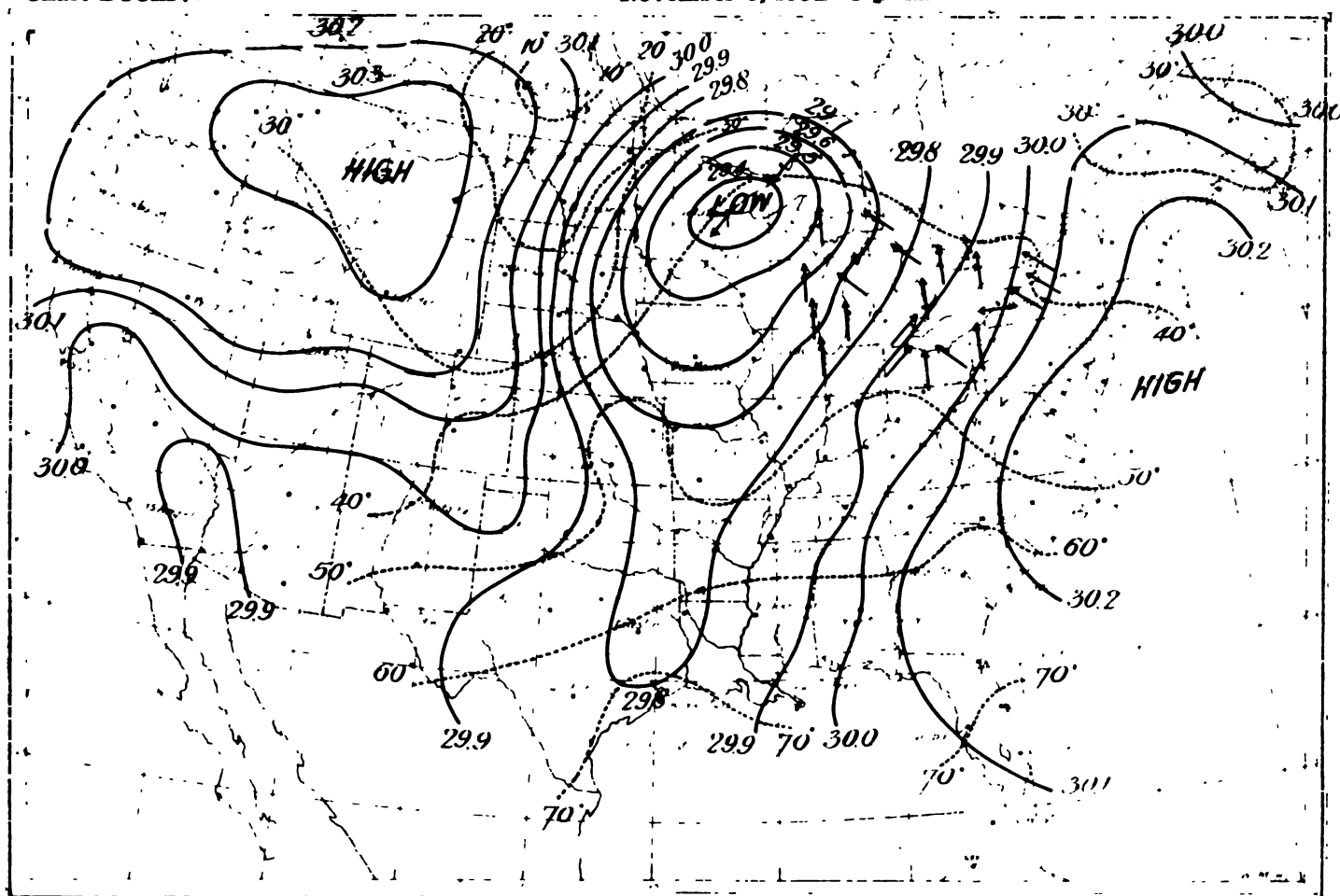


Chart DOOLV.

November 7, 1892—8 a. m.

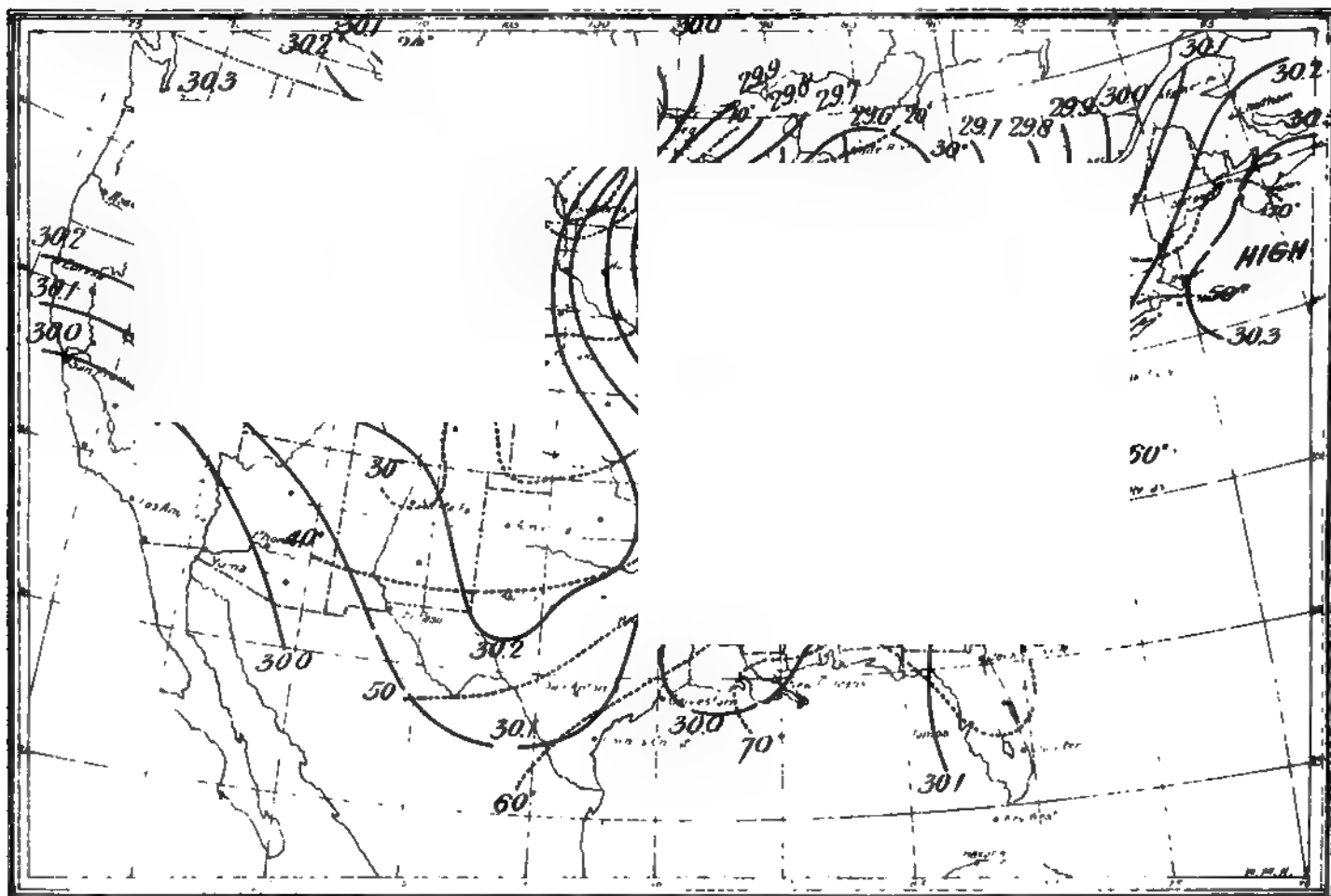


Chart DOOLVI.

November 7, 1892—8 p. m.

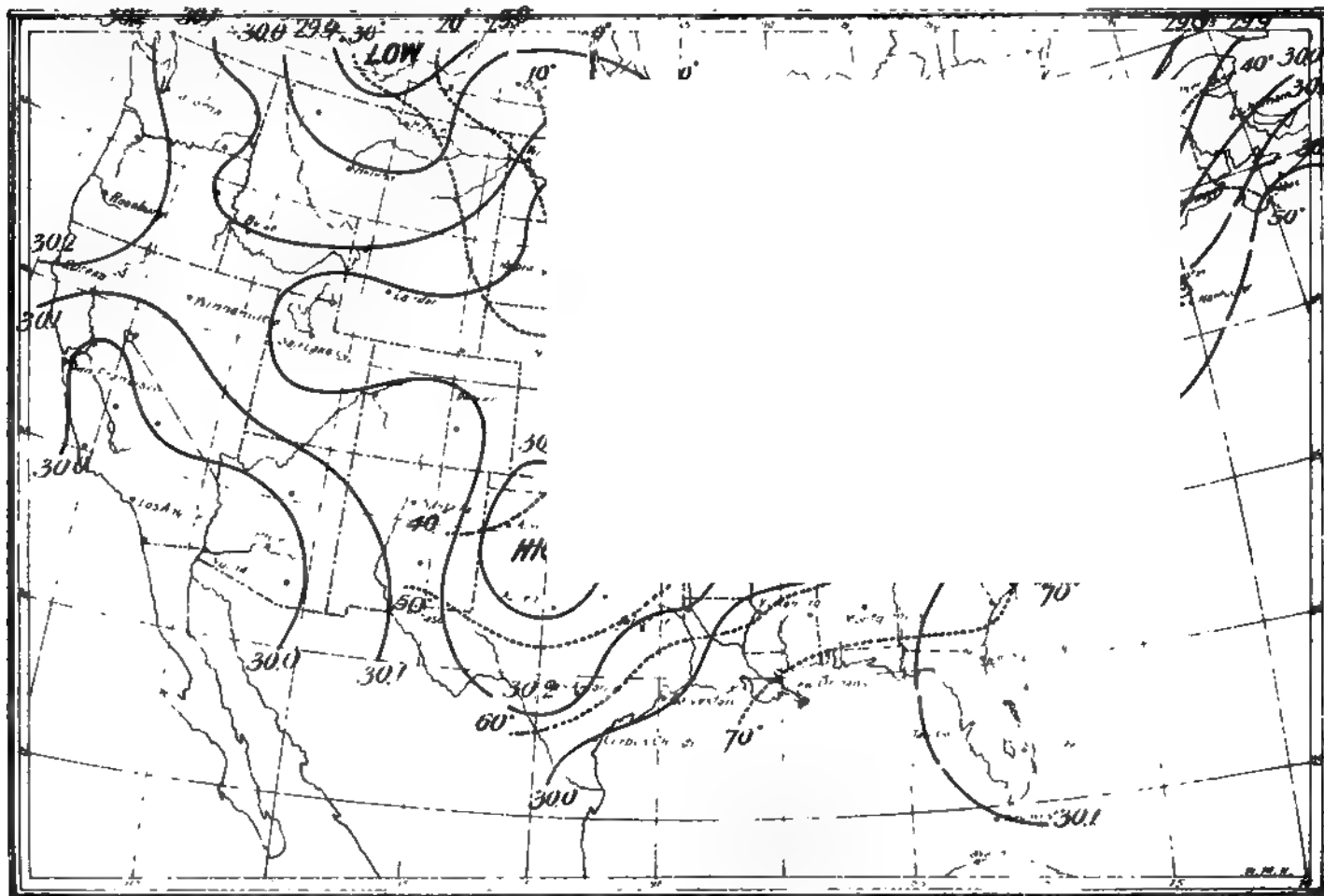


Chart DOCLVII

November 16, 1892—8 a. m.

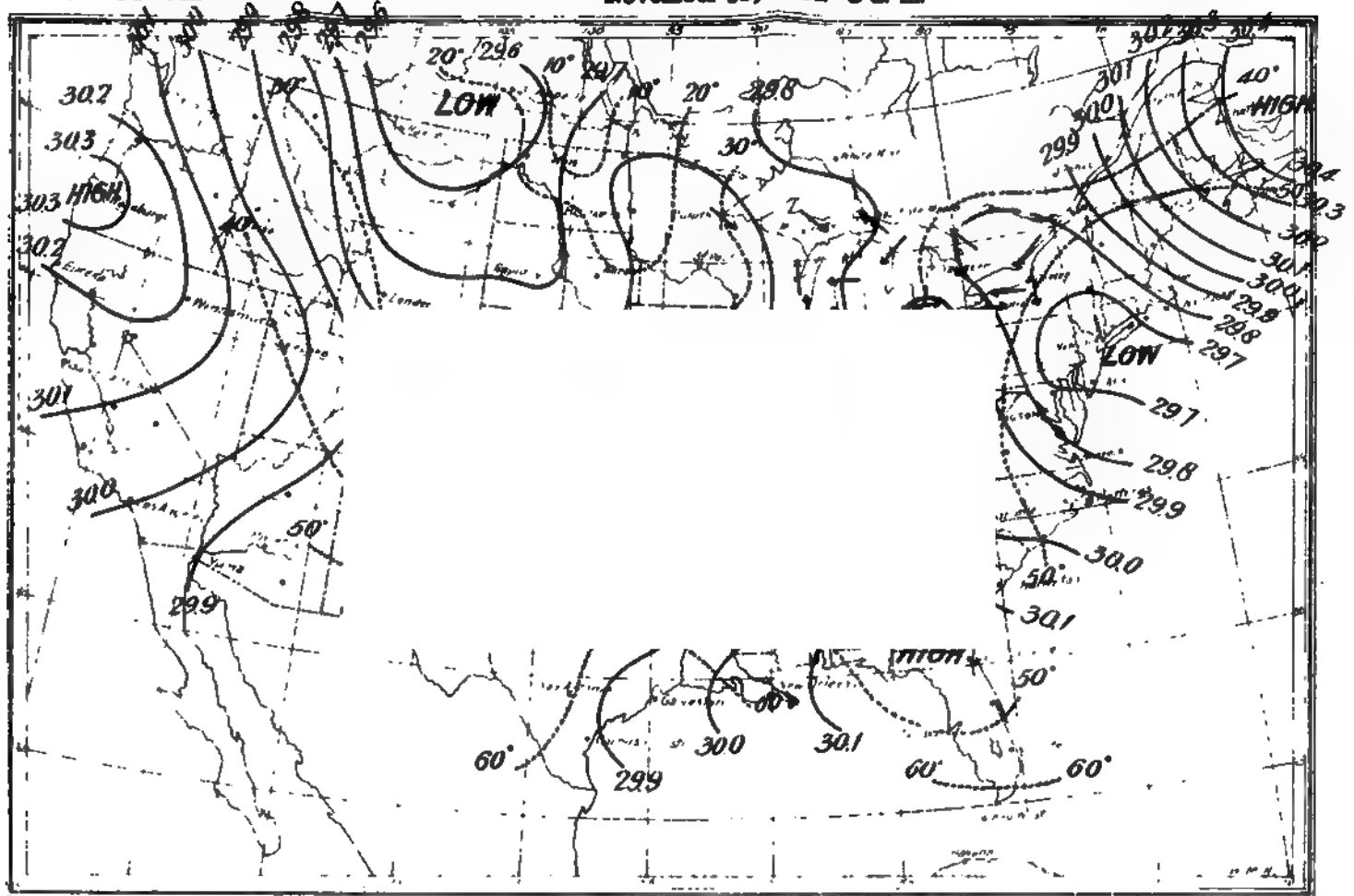


Chart DOCLVIII

November 16, 1892—8 p. m.

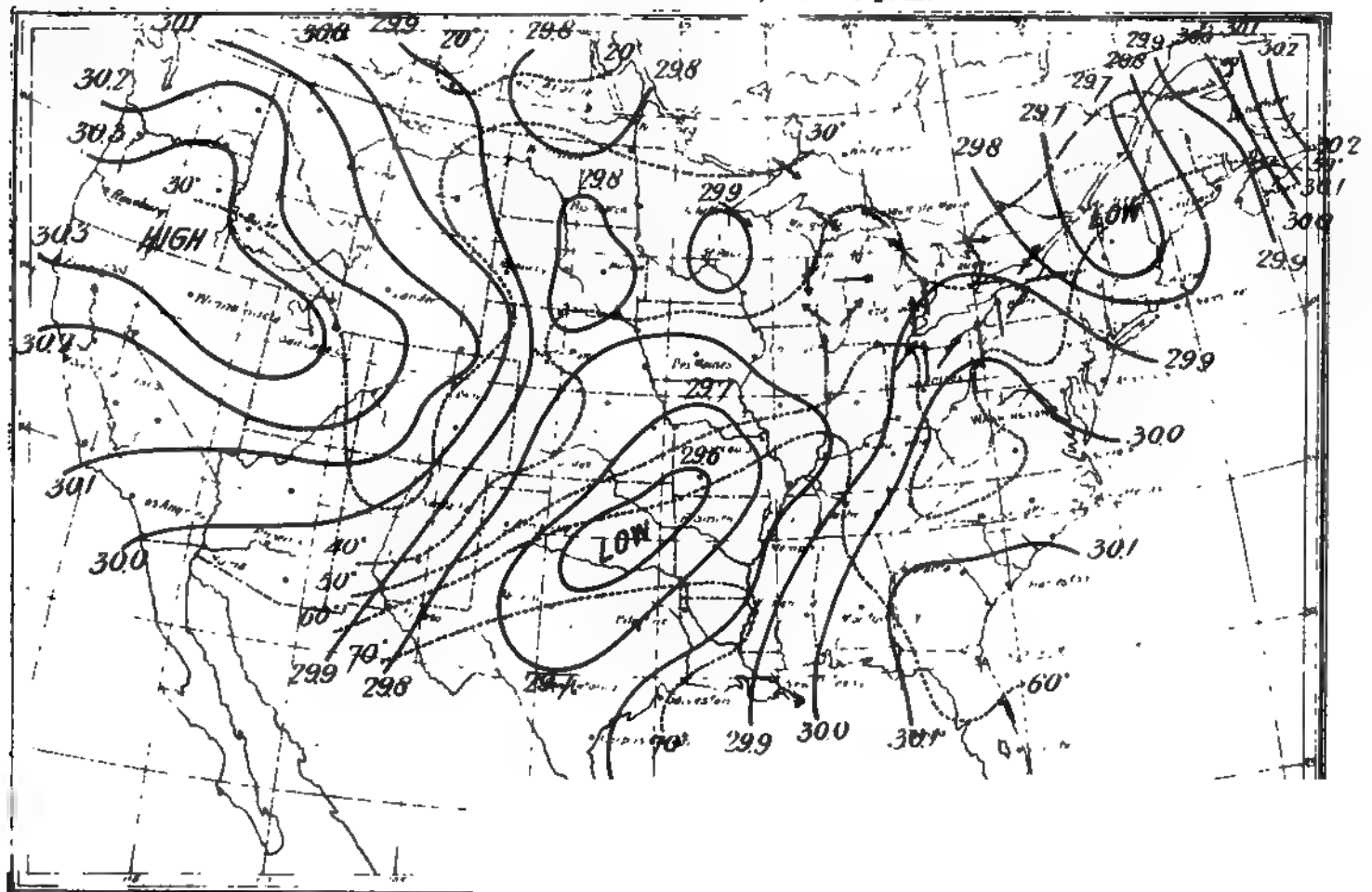


Chart DOOLX.

November 17, 1892—8 a. m.

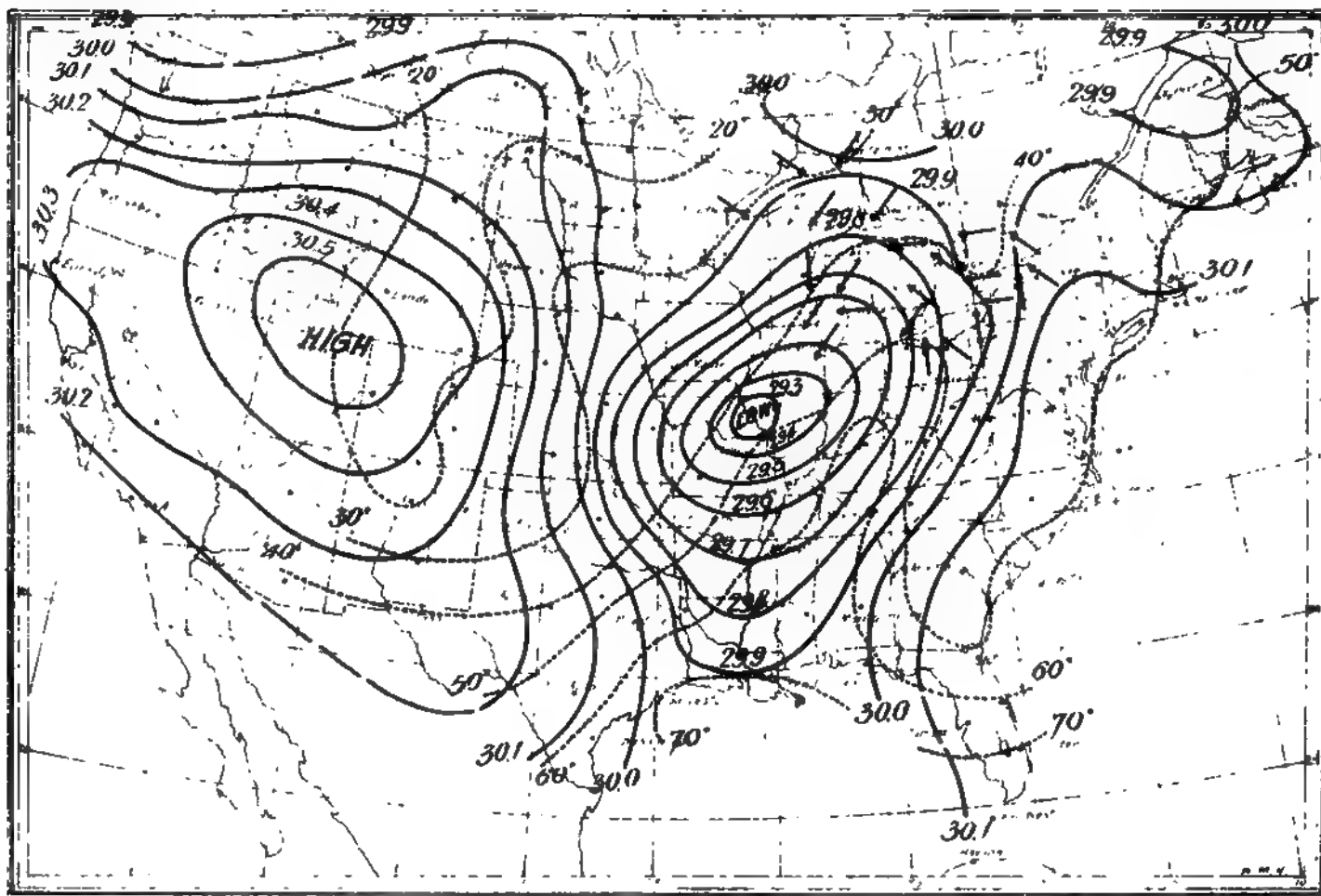


Chart DOOLX.

November 17, 1892—8 p. m.

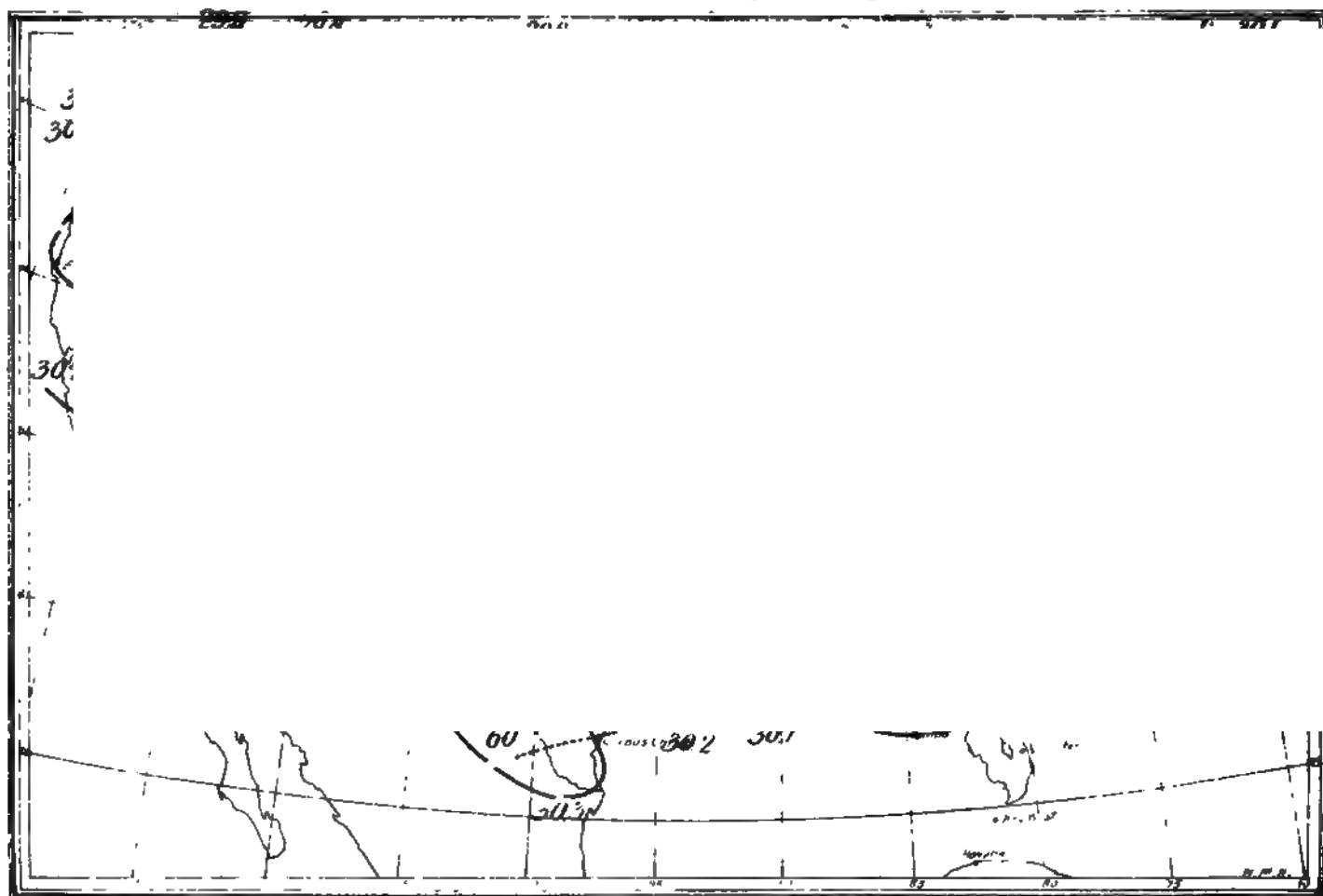


Chart DOOLXI.

November 21, 1893—8 a. m.

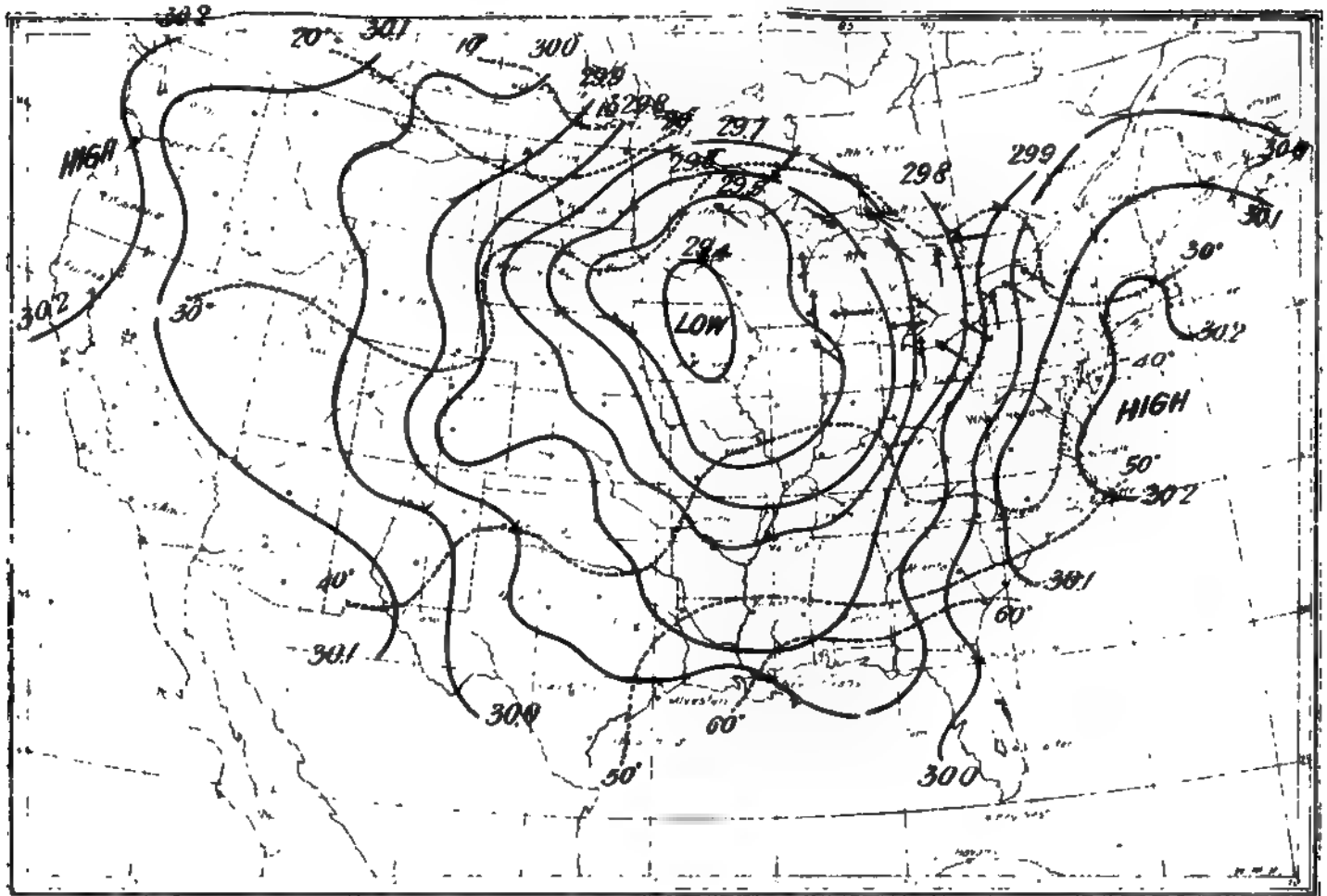


Chart DOOLXII.

November 21, 1893—8 p. m.

Chart DOOLXIII.

November 22, 1898—8 a. m.

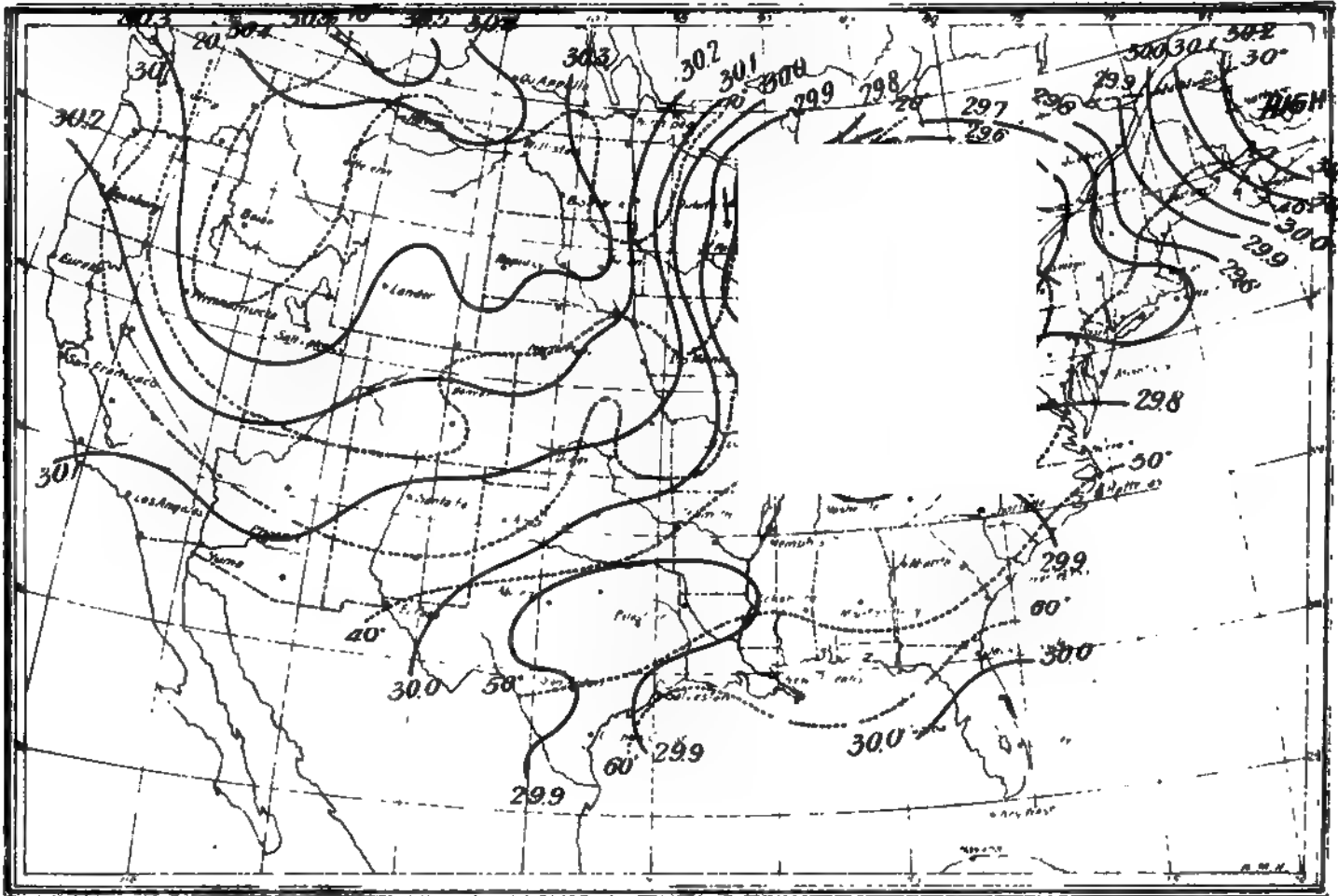


Chart DOOLXIV.

November 22, 1898—8 p. m.

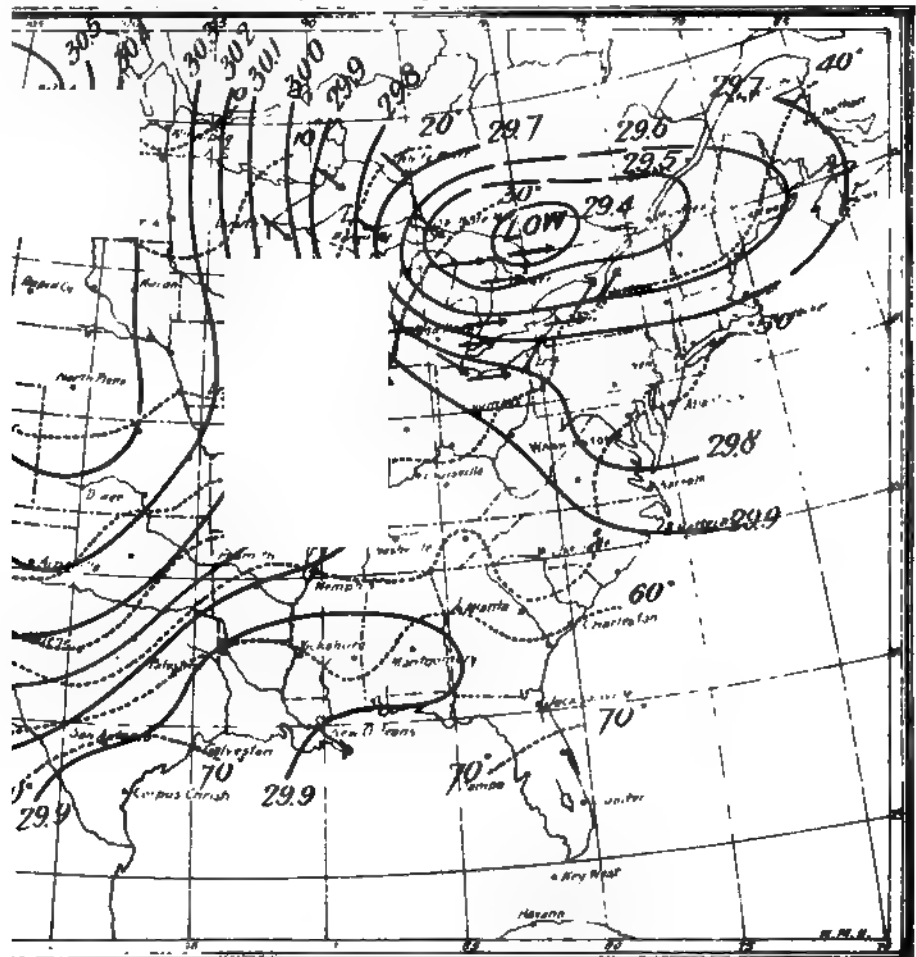


Chart DCCLXV.

November 1, 1894—8 a. m.

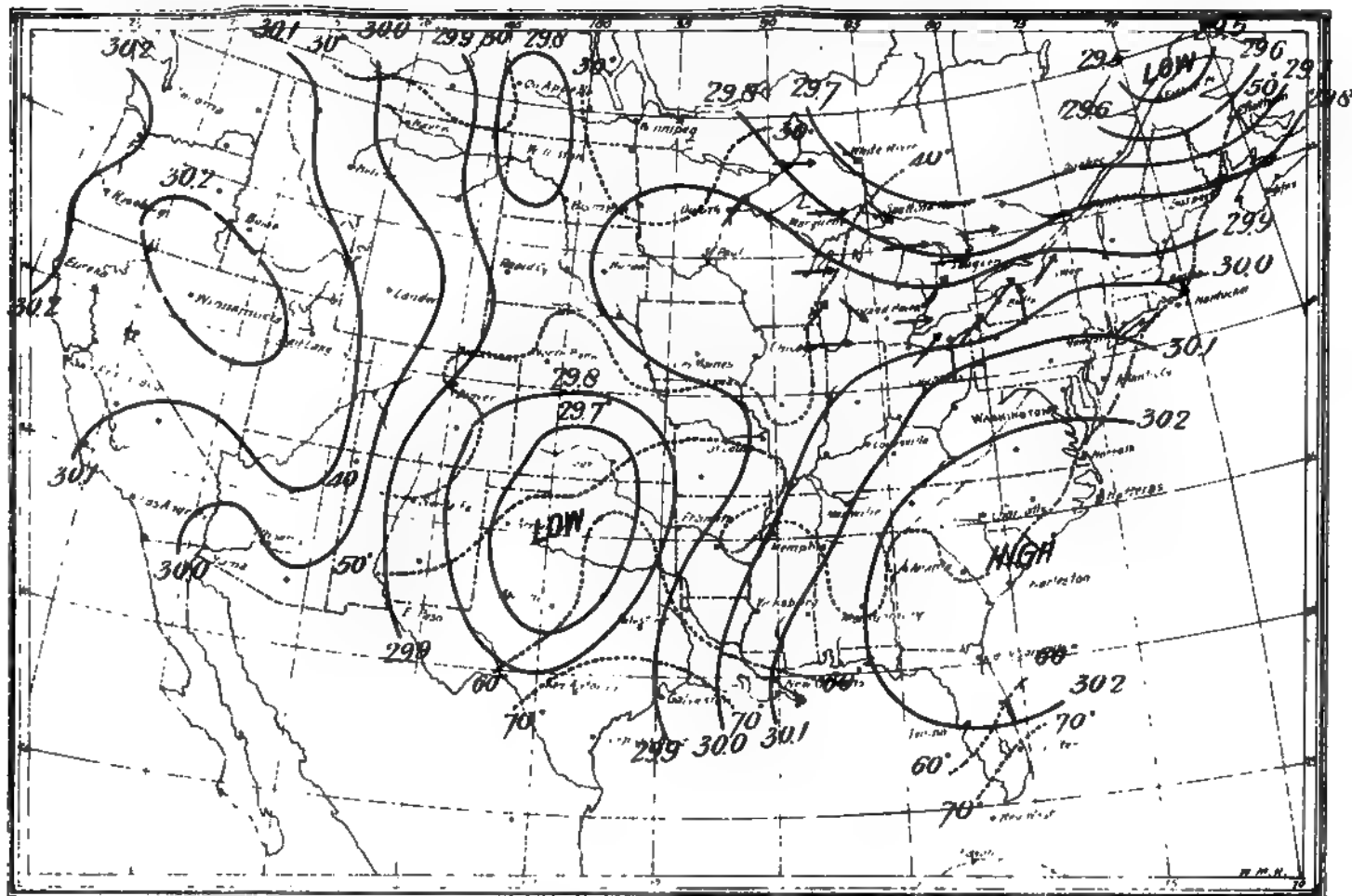
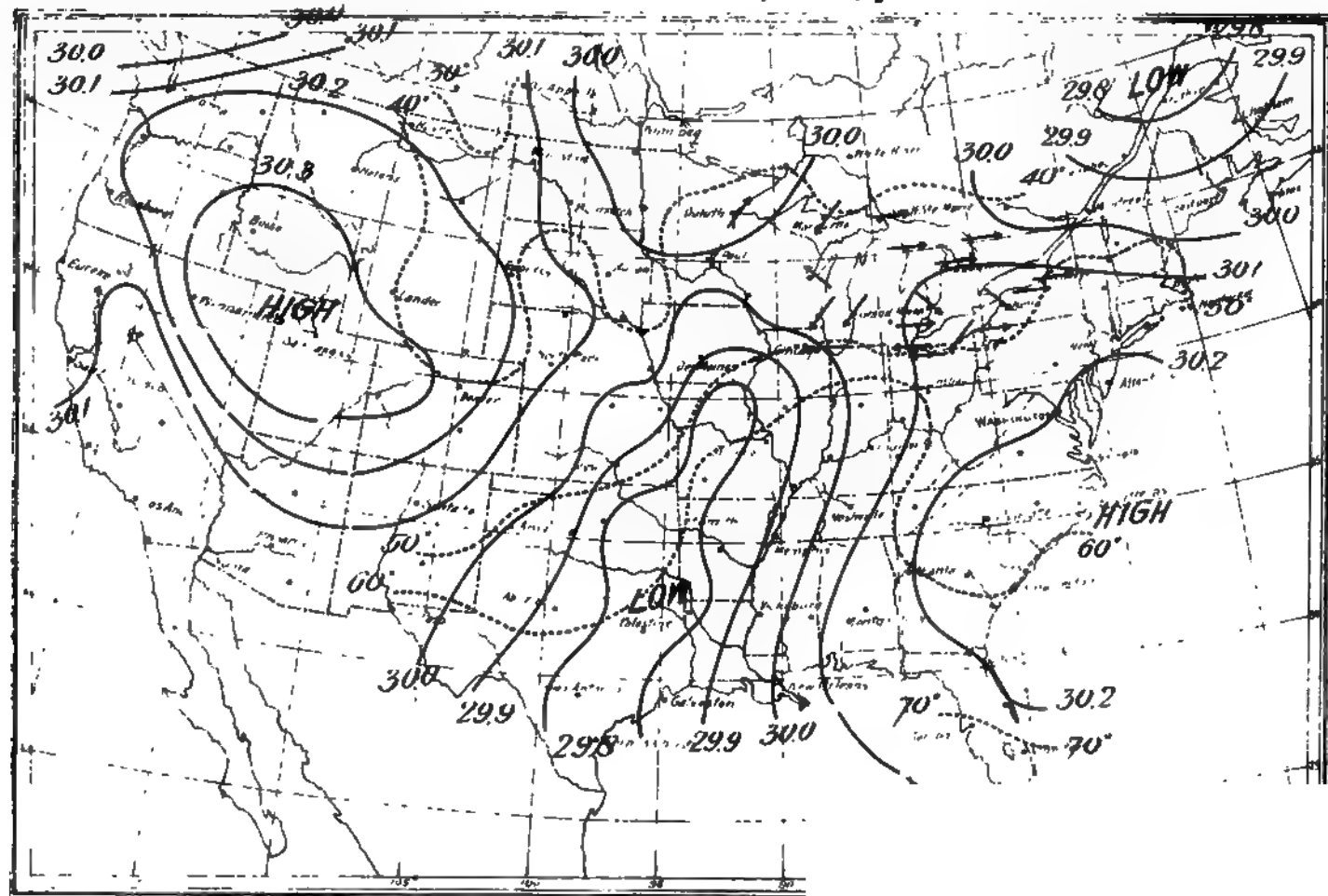


Chart DCCLXVI.

November 1, 1894—8 p. m.



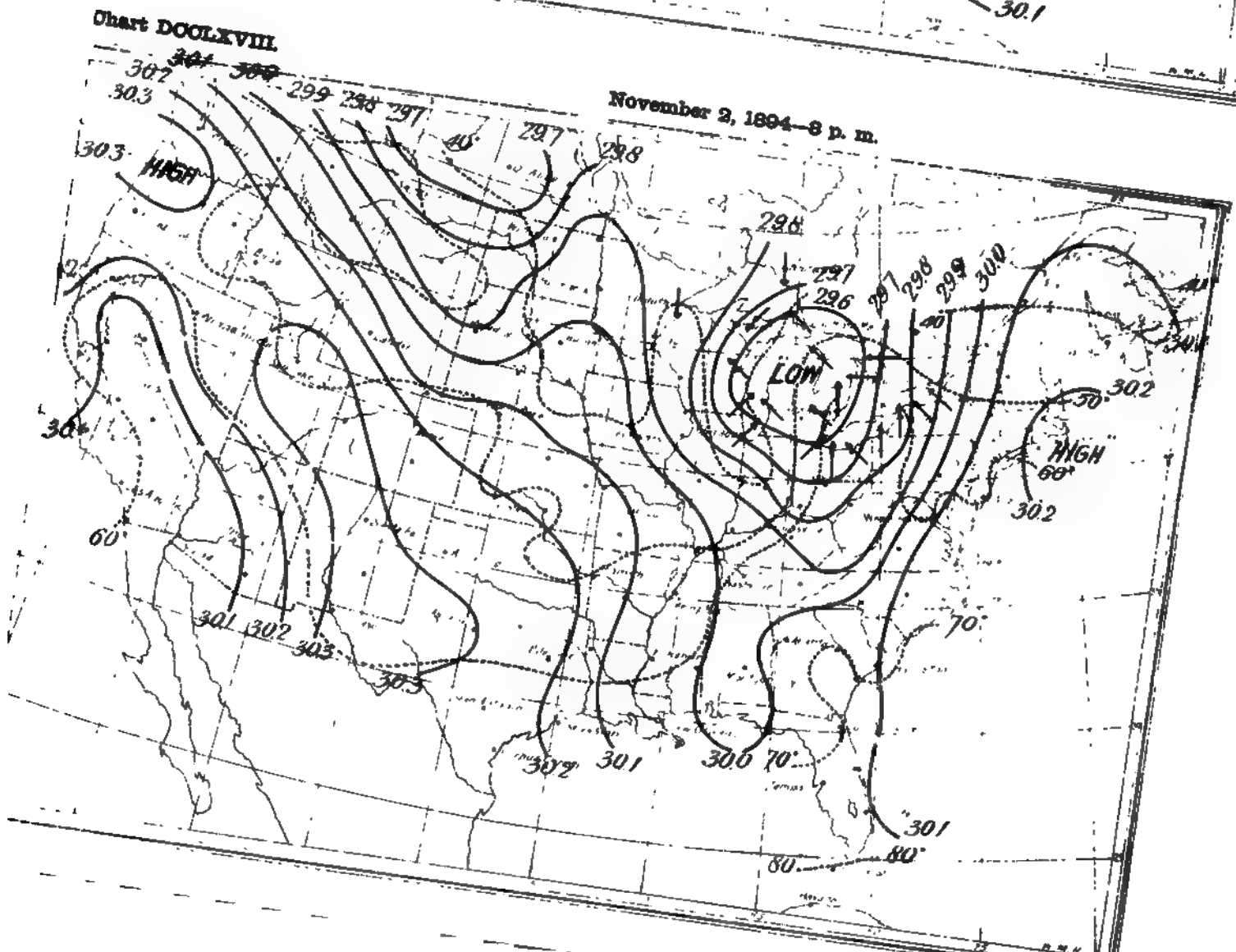
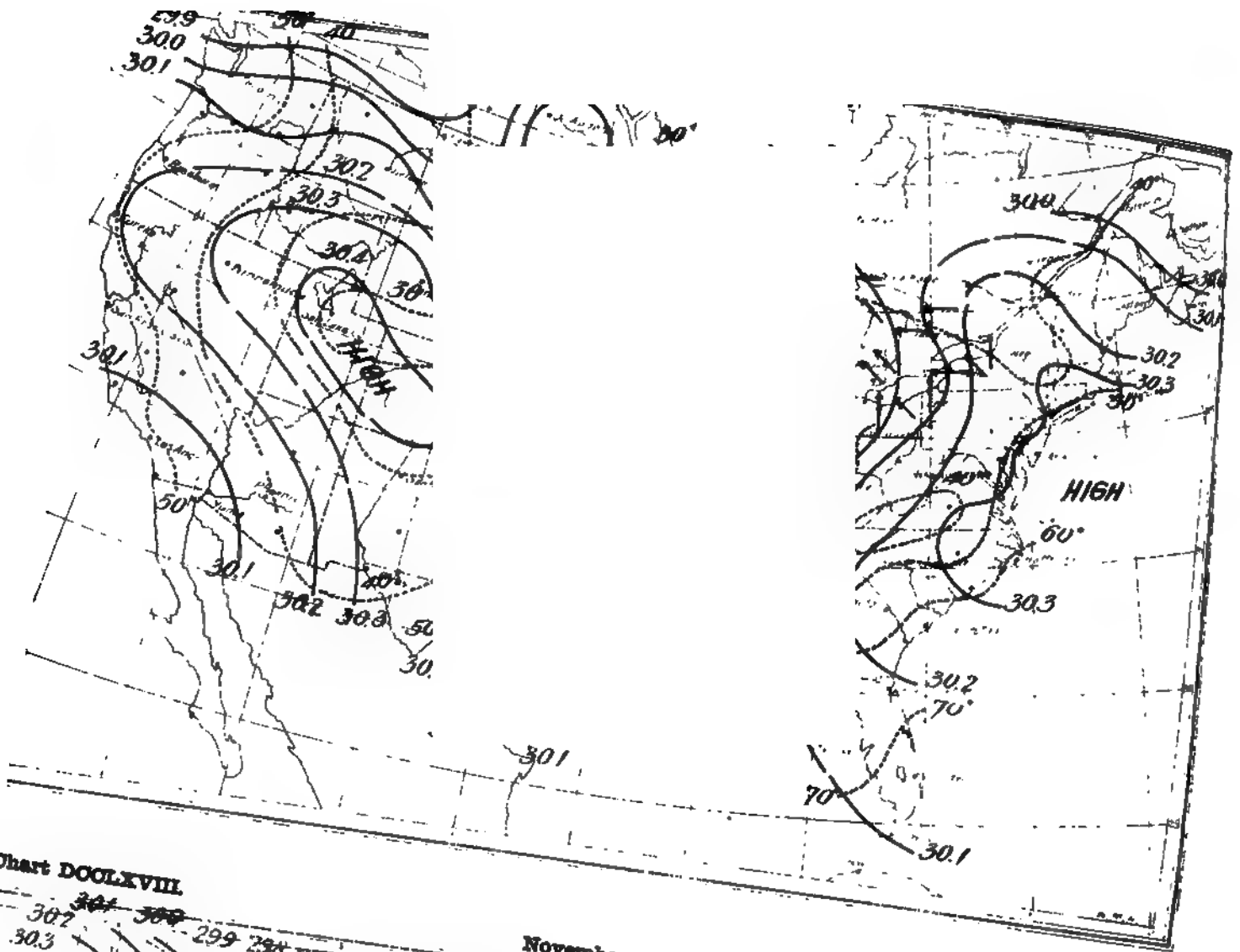


Chart DCCLXIX.

November 8, 1894—8 p. m.

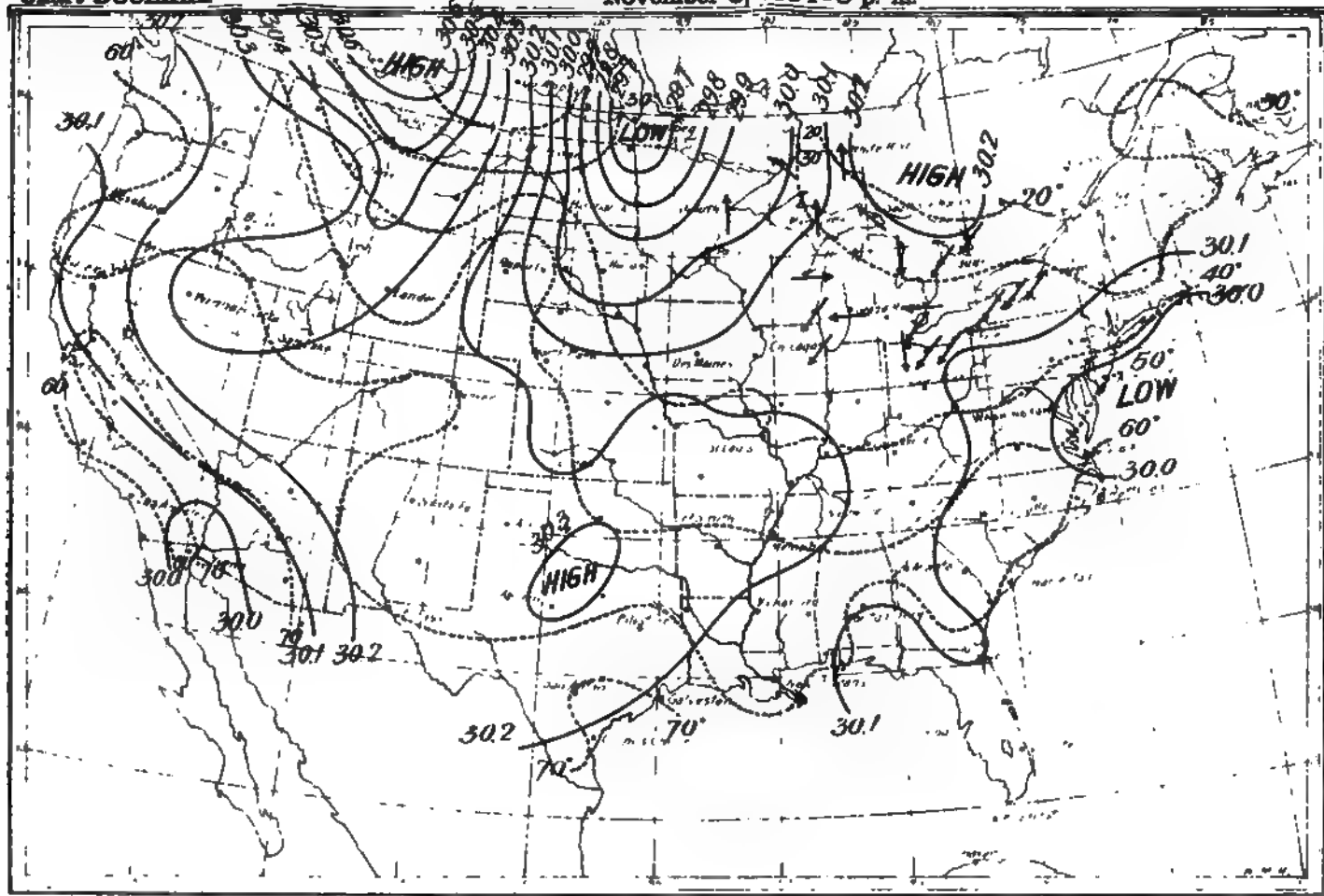


Chart DCCLXX.

November 9, 1894—8 a. m.

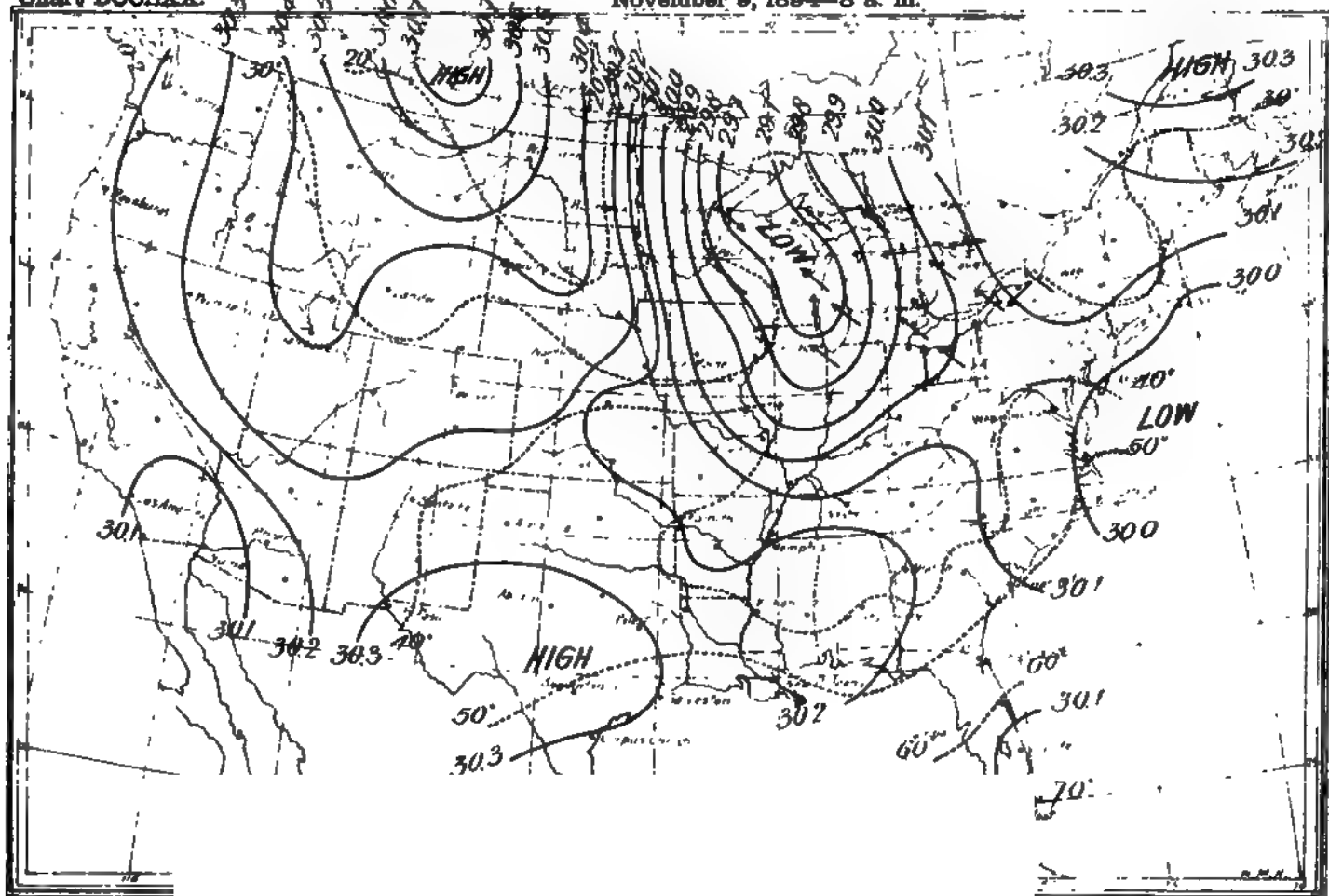


Chart DOOLXXI.

November 9, 1894—8 p. m.

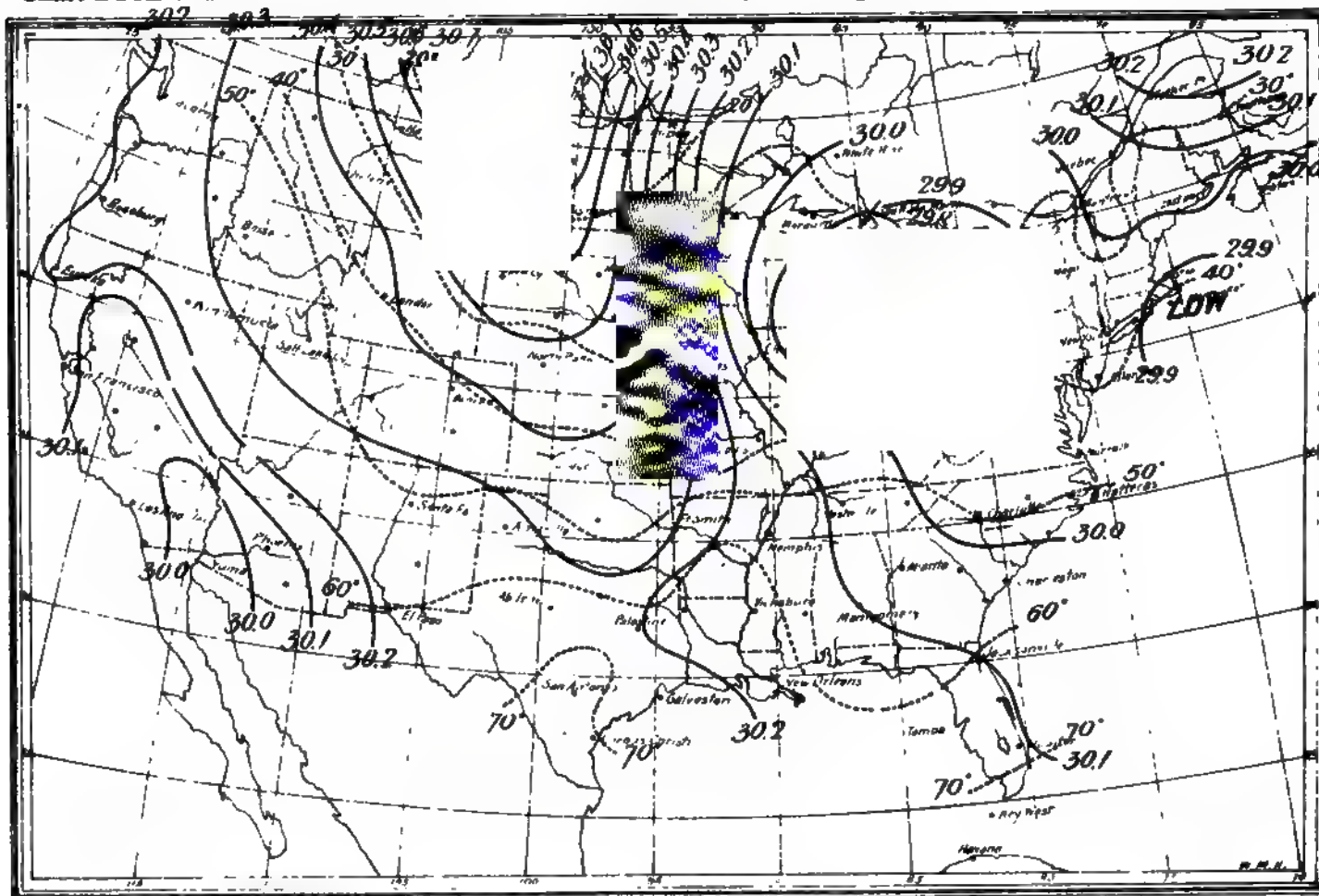


Chart DOOLXXII.

November 10, 1894—8 a. m.

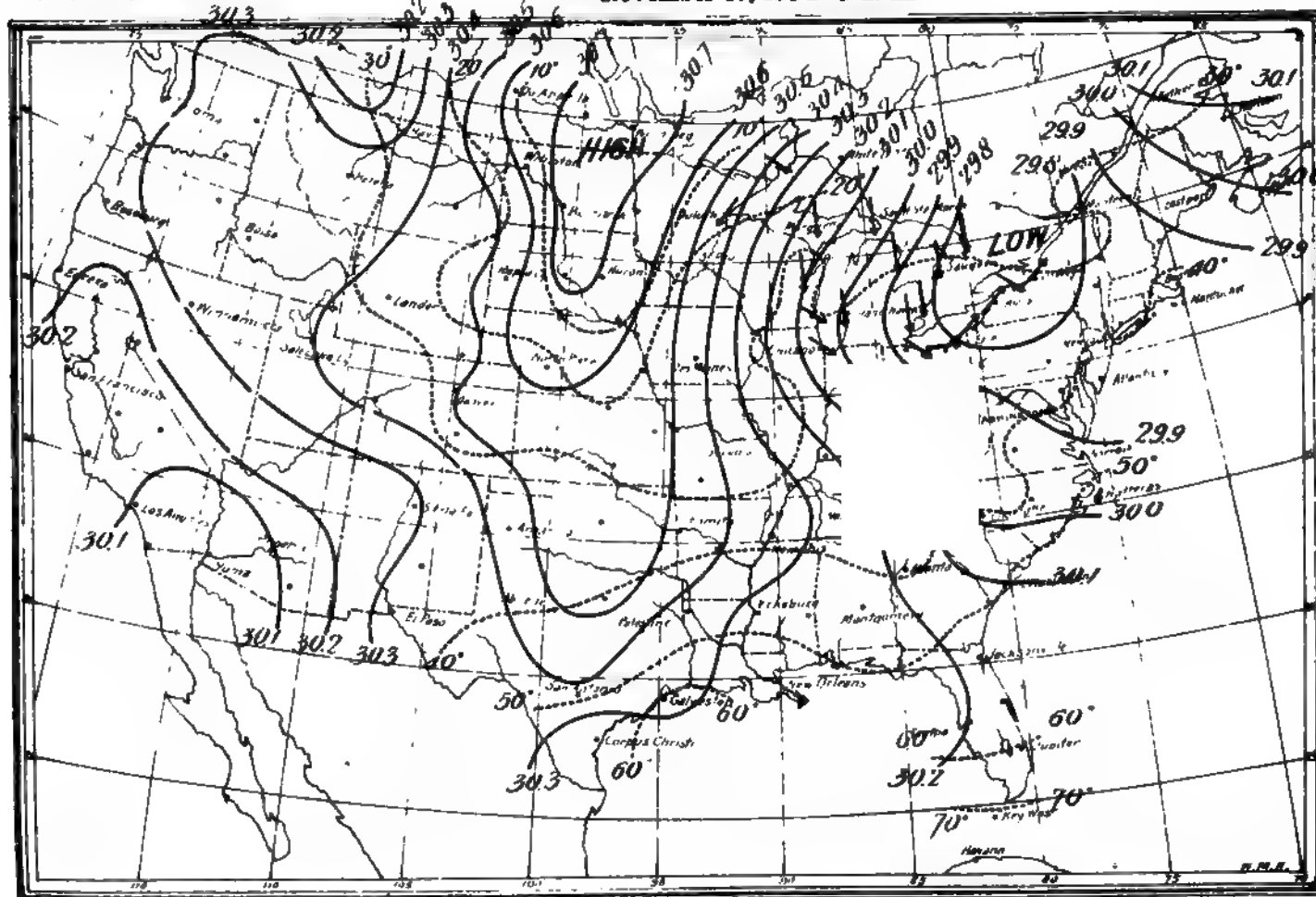


Chart DOOLXXIII.

November 25, 1894—8 a. m.

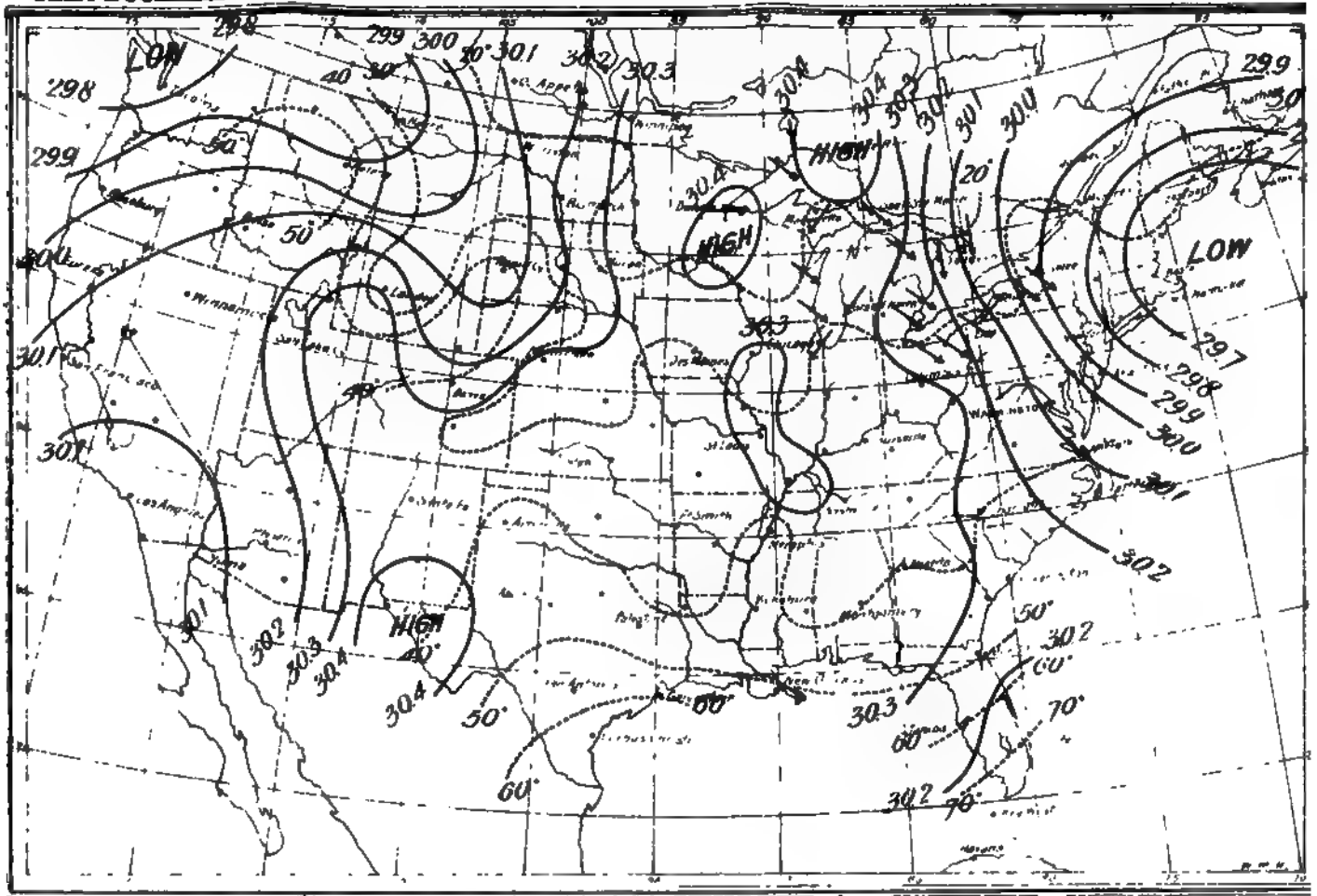


Chart DOOLXXIV.

November 25, 1894—8 p. m.

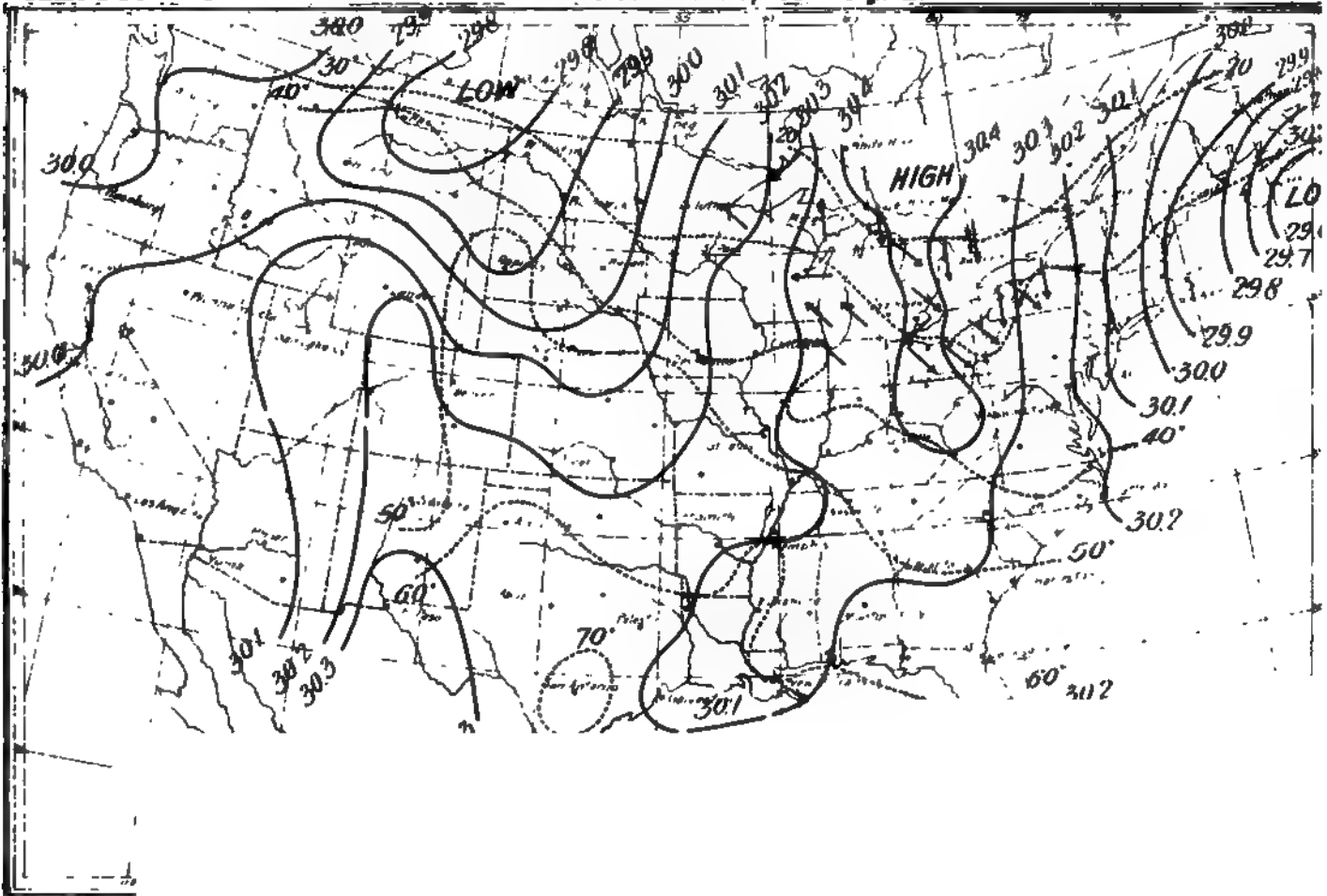




Chart DCCLXXVII.

November 24, 1895—8 p. m.

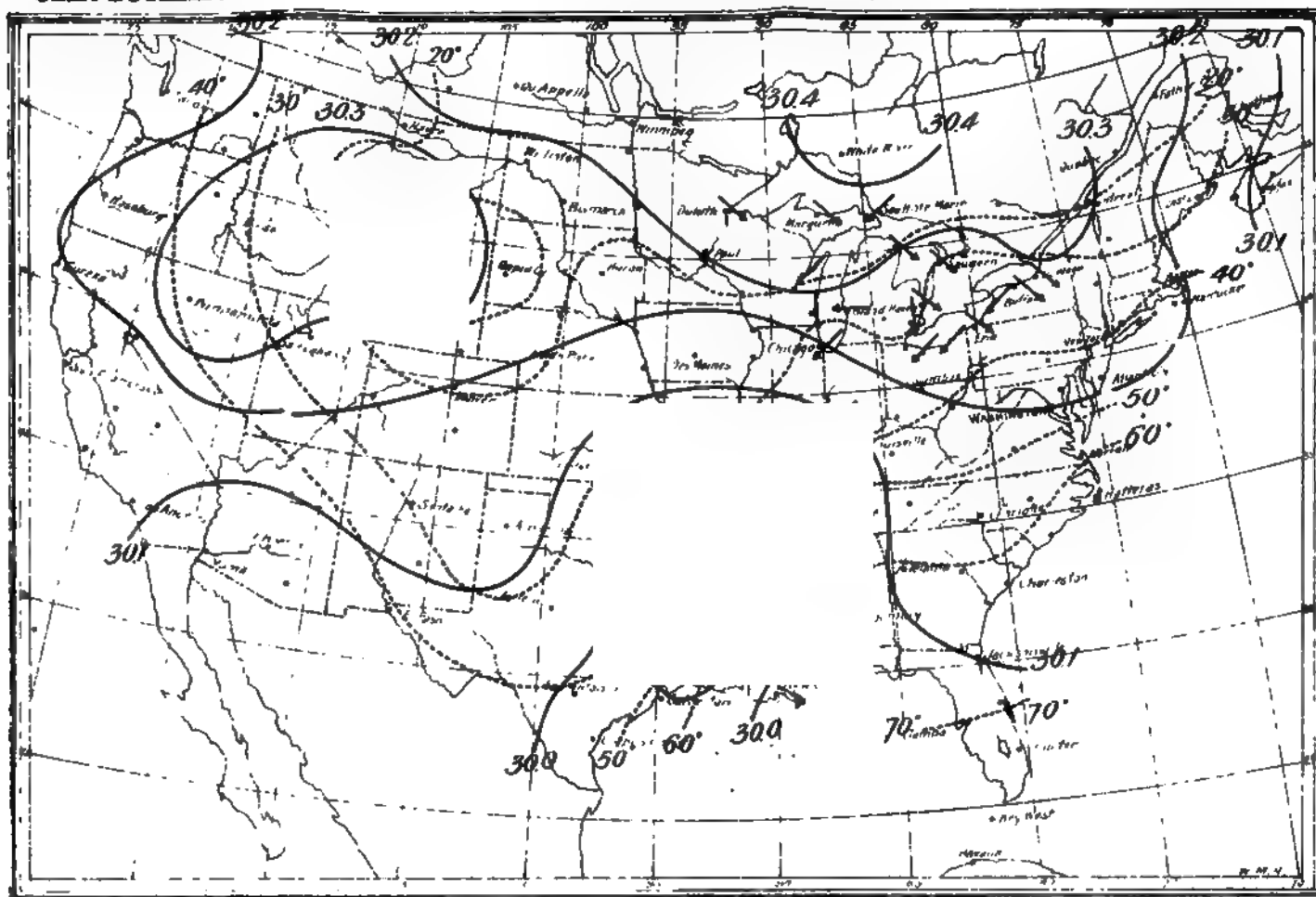


Chart DCCLXXVIII.

November 25, 1895—8 a. m.

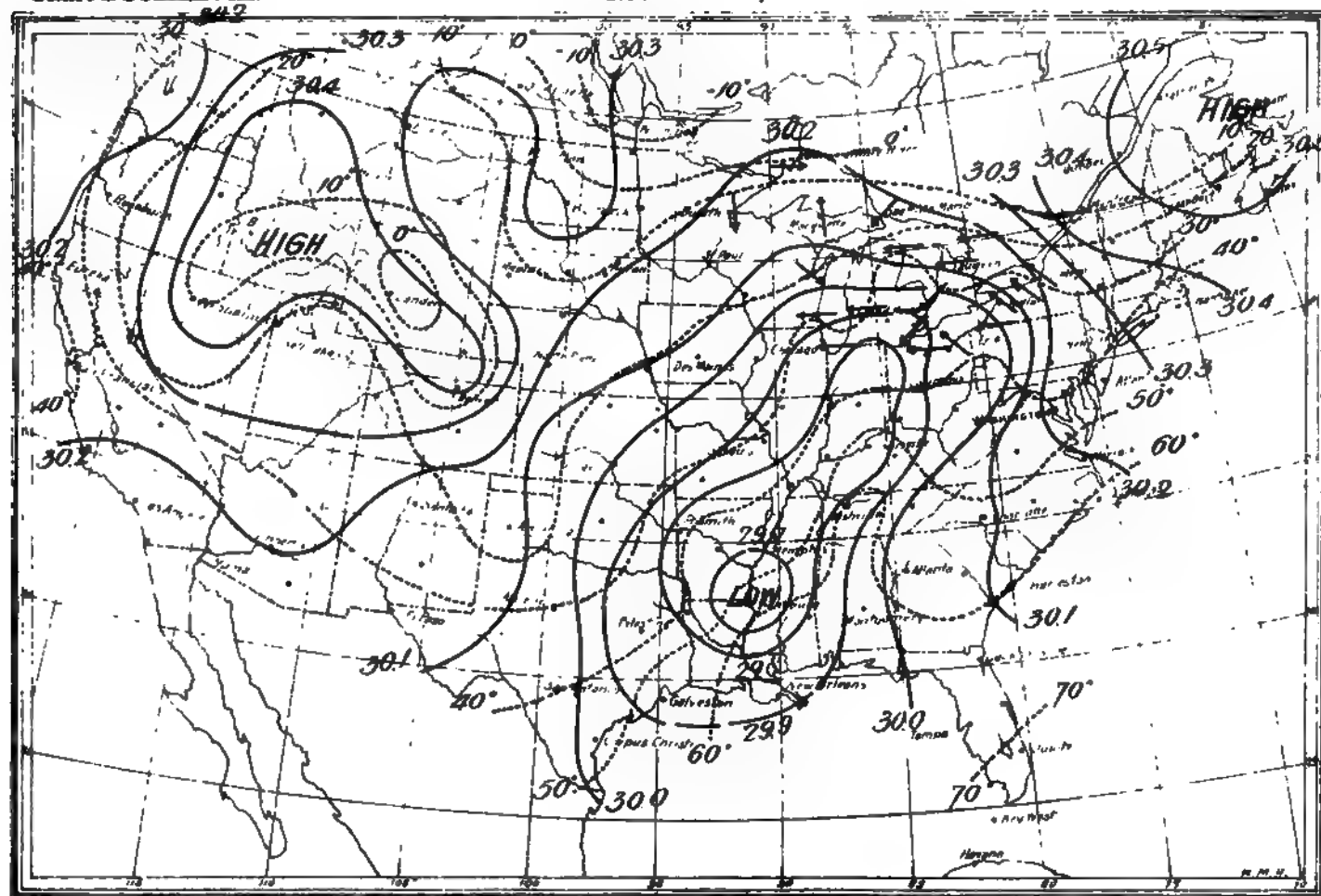


Chart DOOLXXIX.

November 25, 1895—8 p. m.

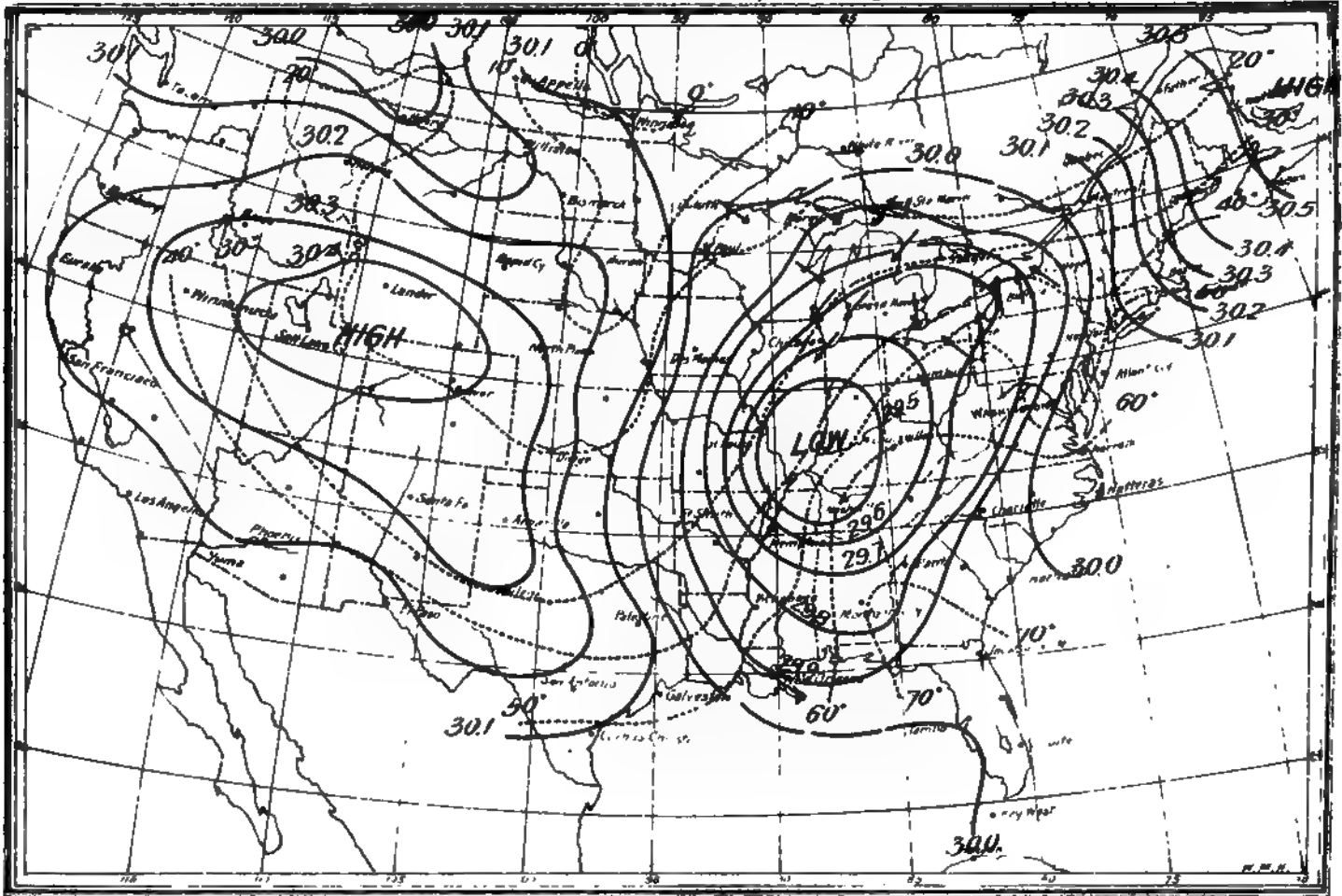


Chart DOOLXXX.

November 26, 1895—9 a. m.

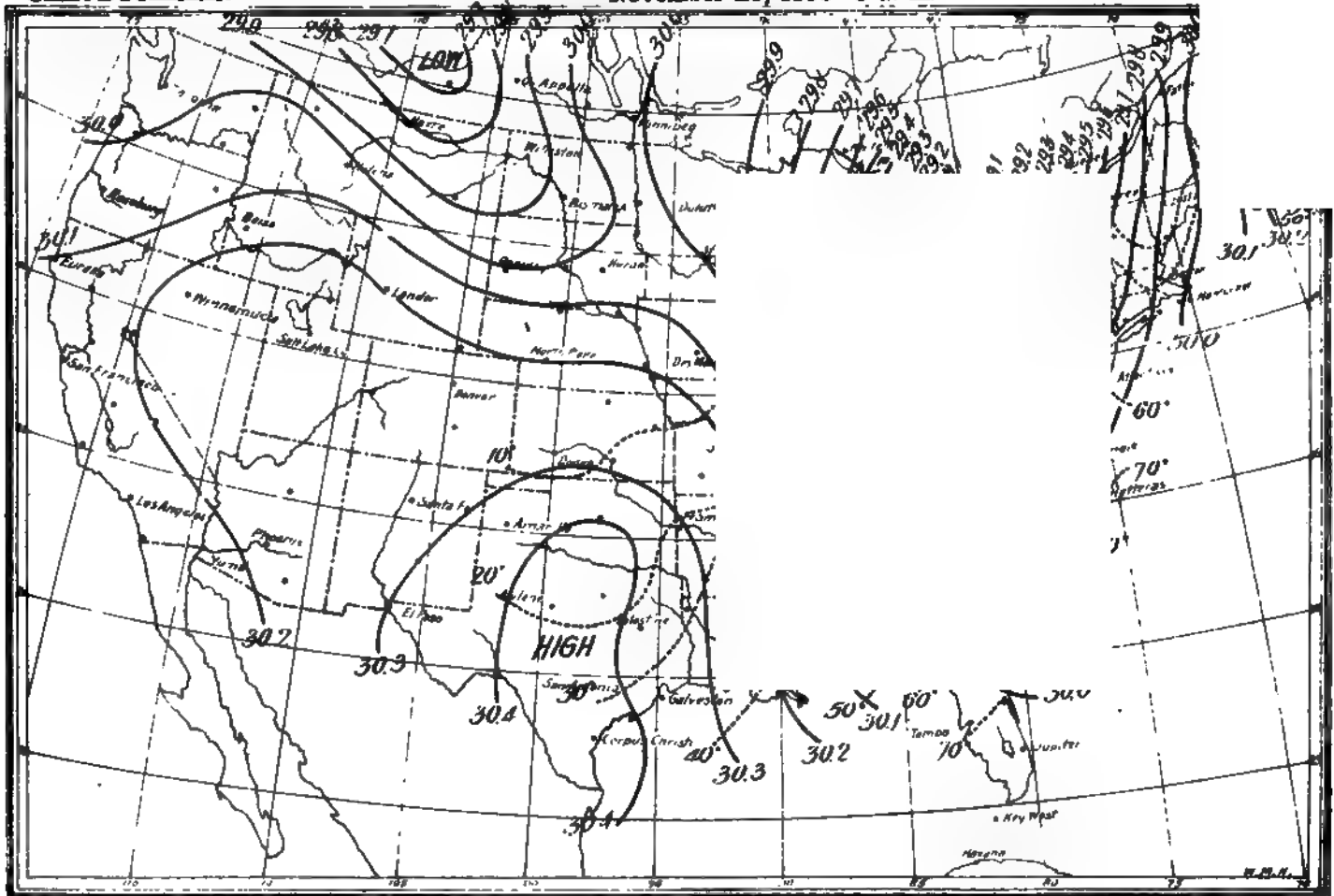


Chart DOOLXXXI.

November 2, 1896—8 a. m.

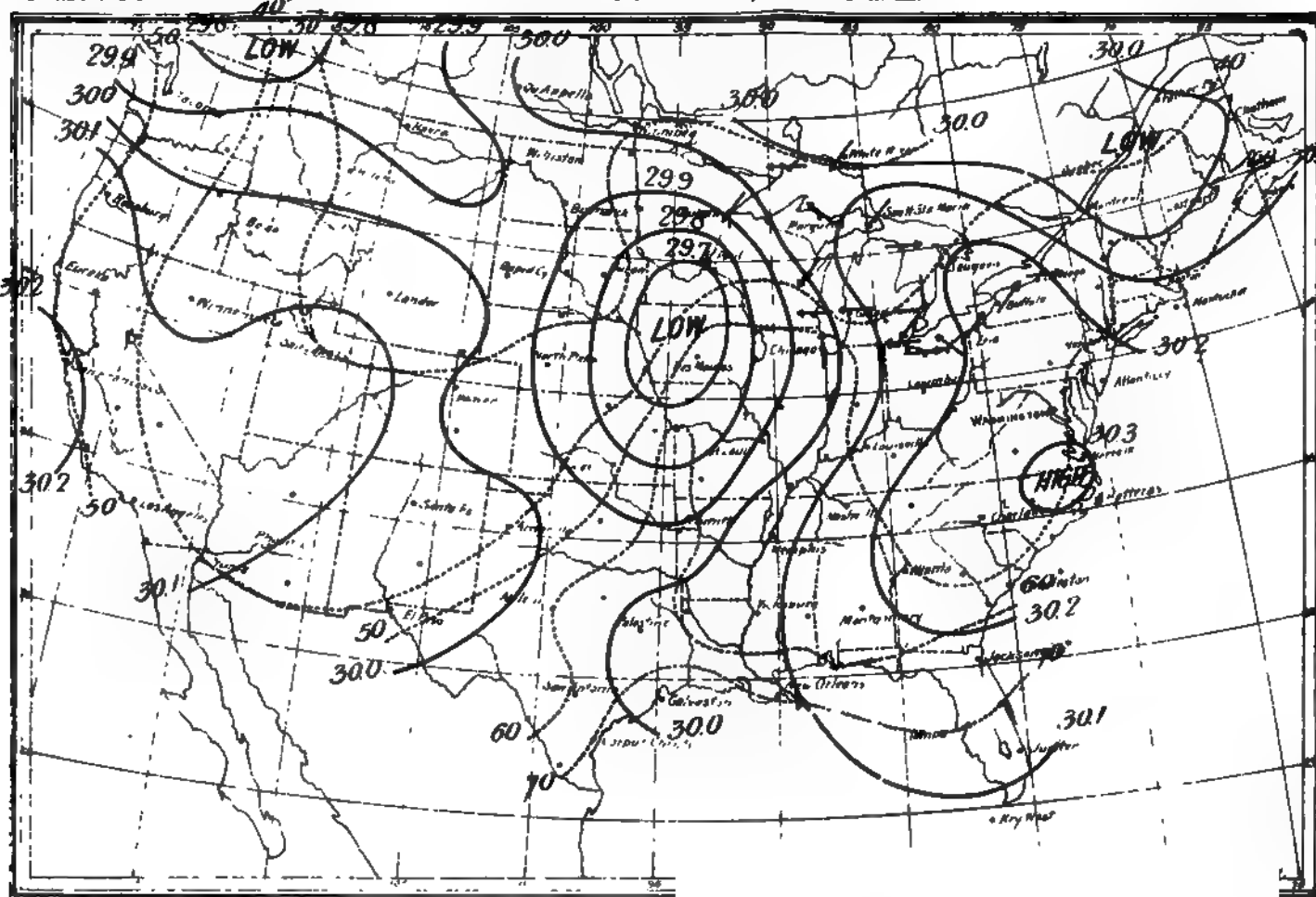
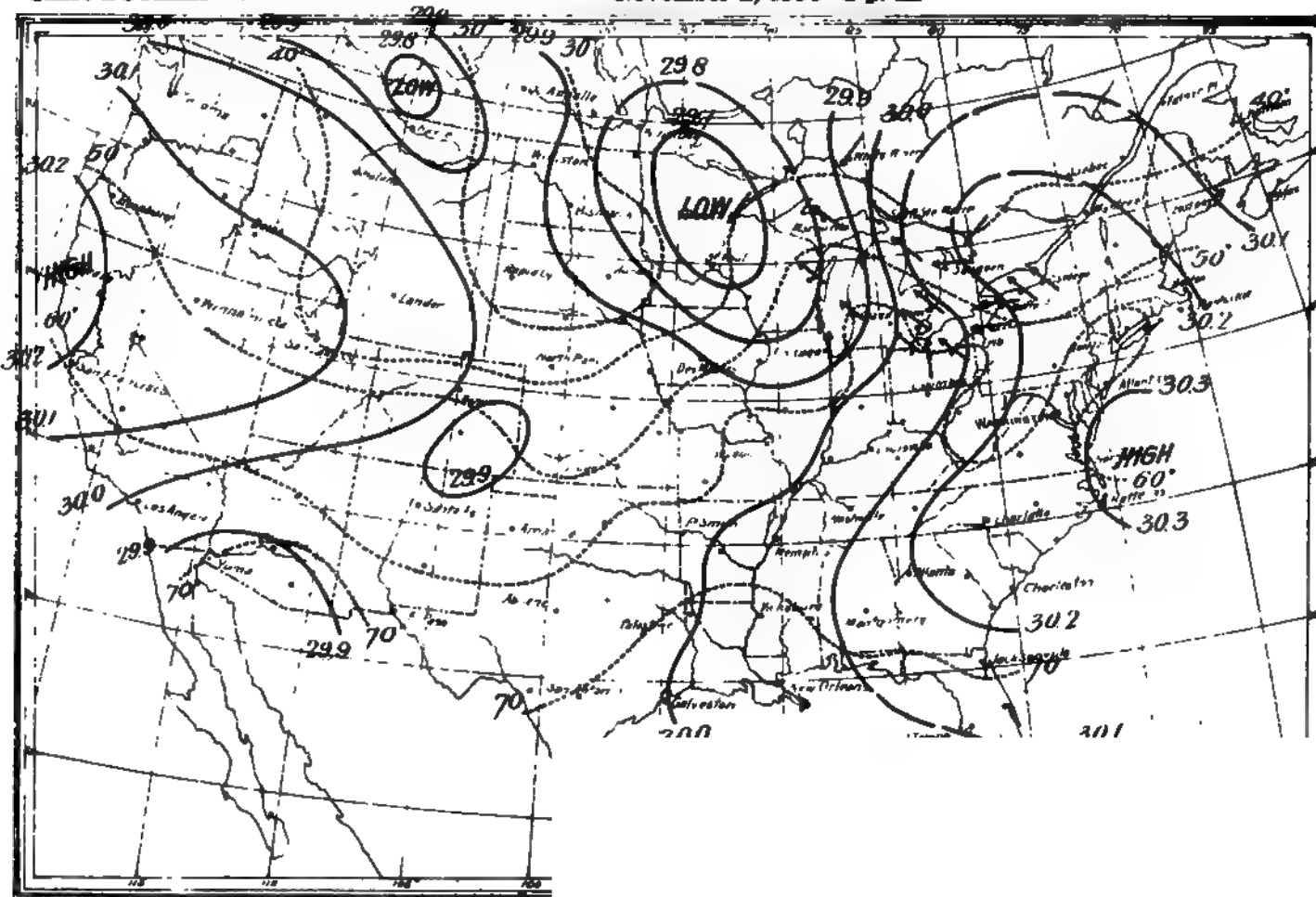
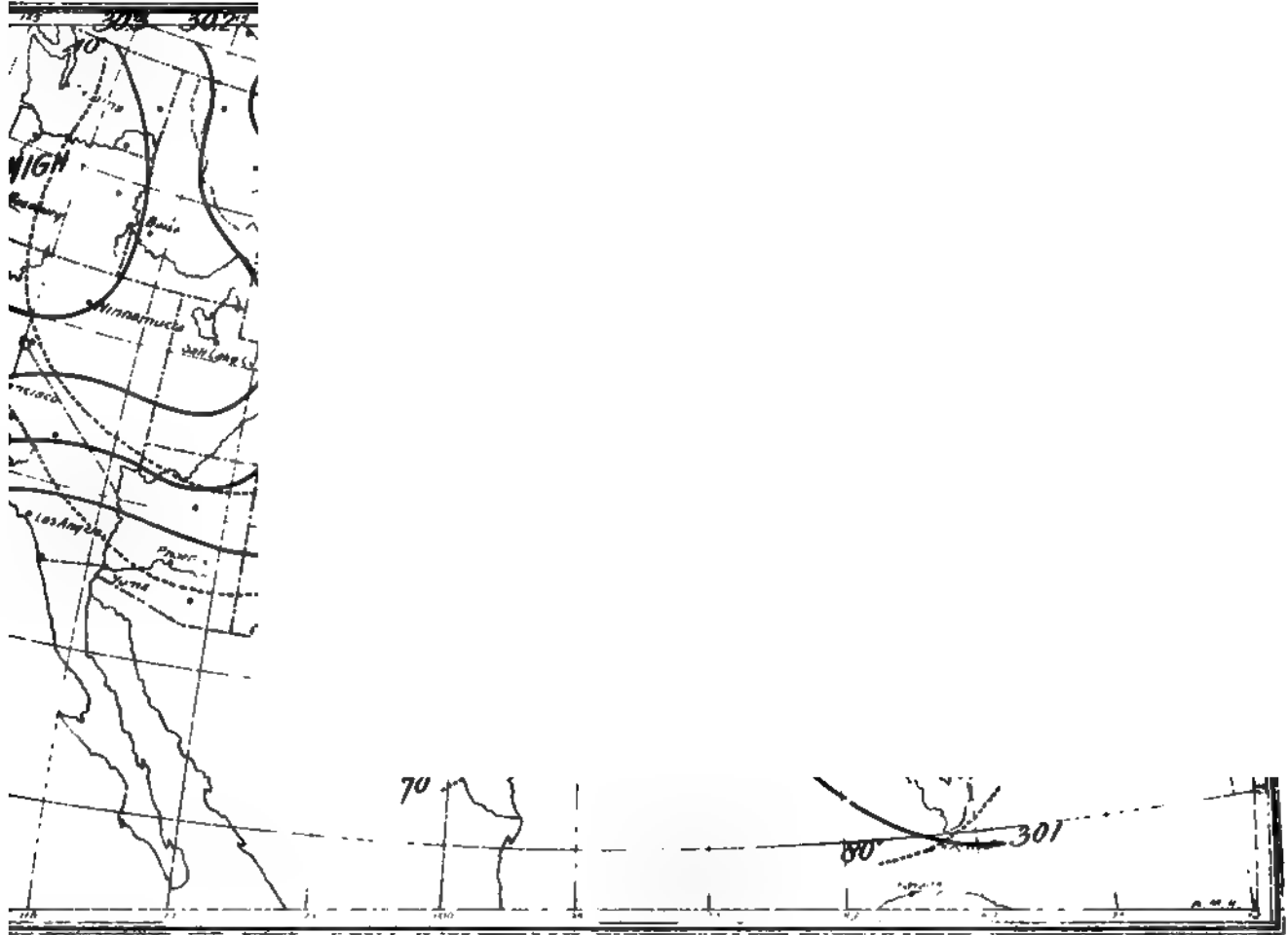


Chart DOOLXXXII.

November 2, 1896—8 p. m.



COOLXXXIII.



COOLXXXIV.

November 3, 1896—8 p. m.

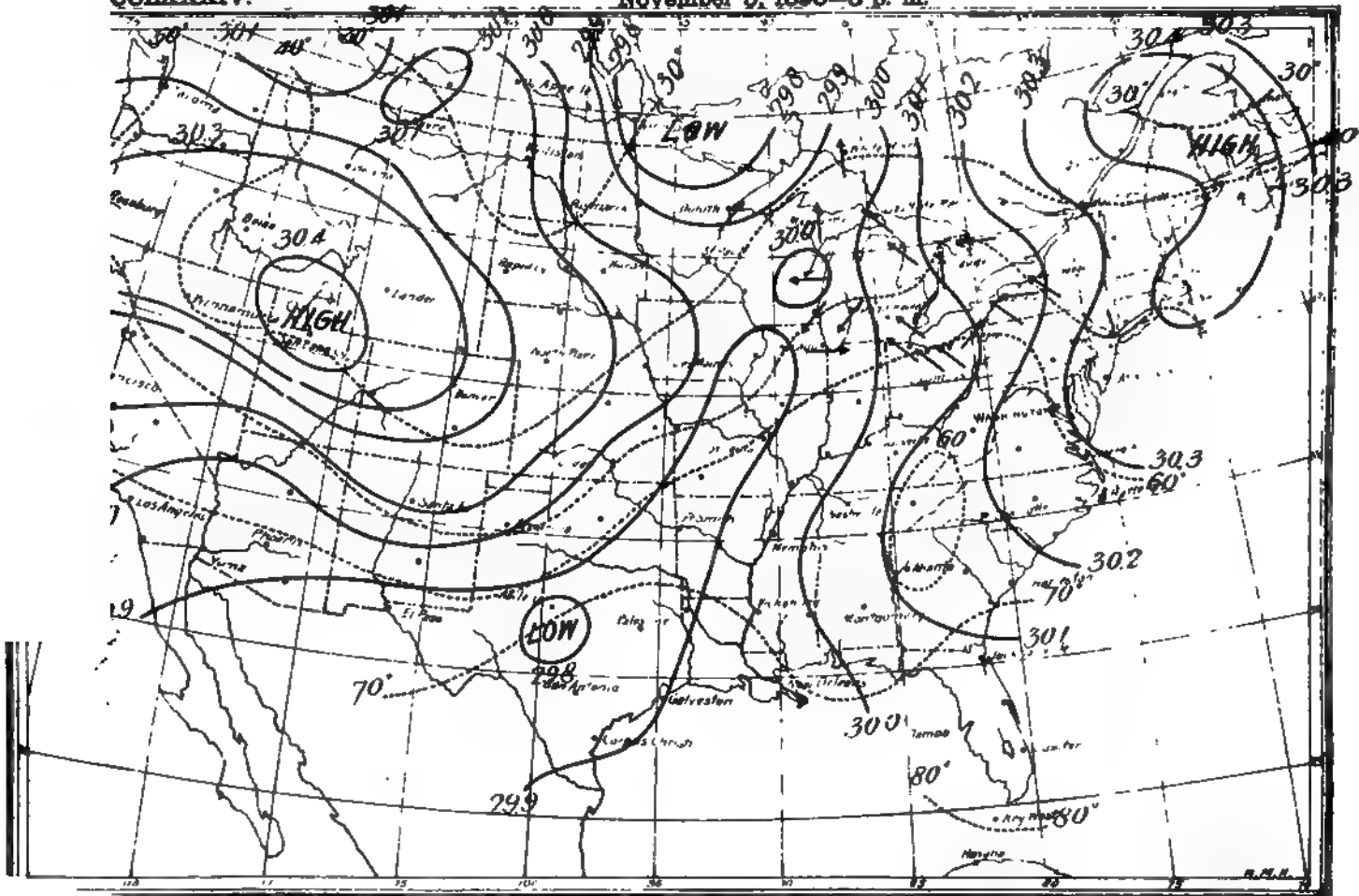


Chart DOOLXXXV.

November 4, 1896—8 a. m.

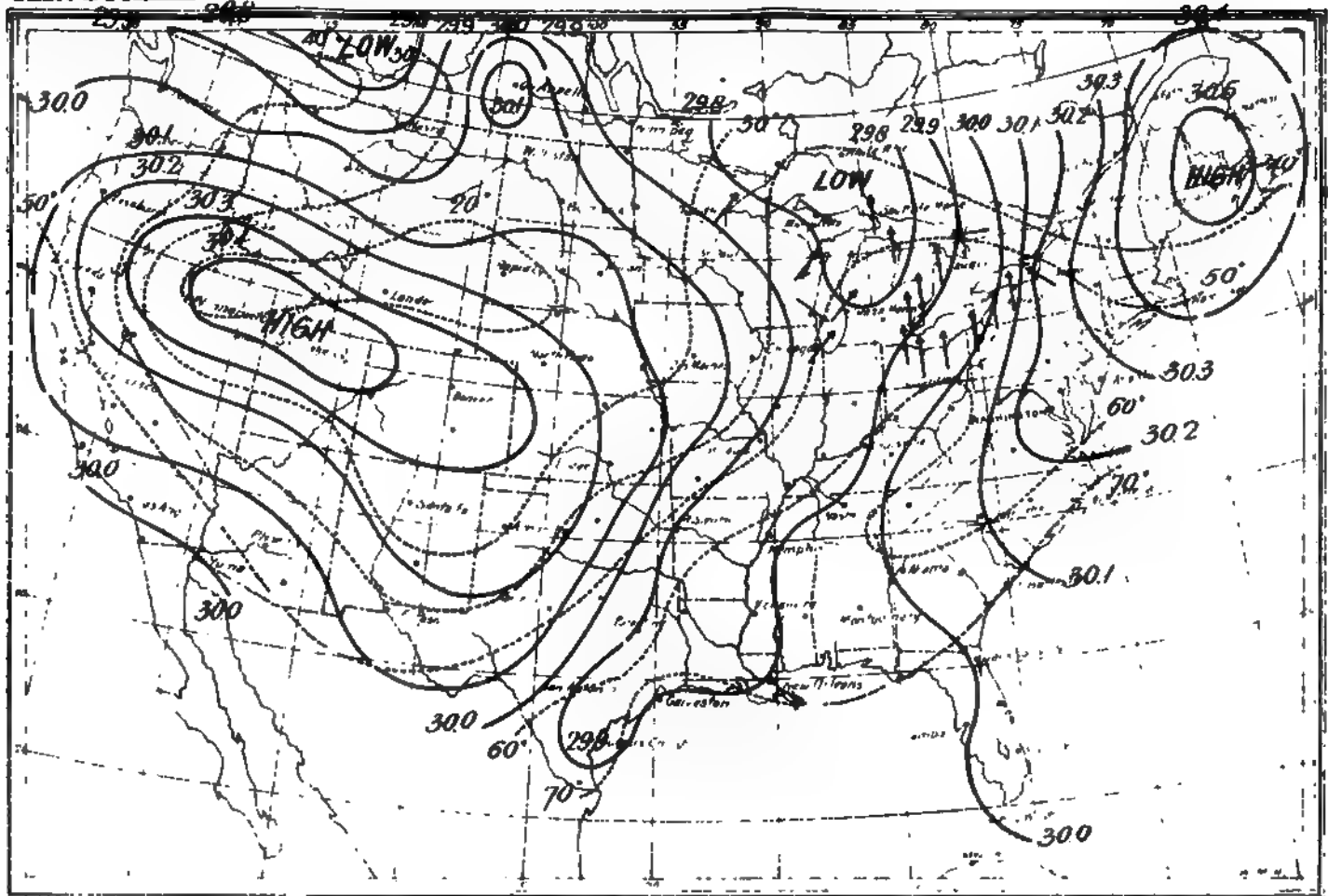
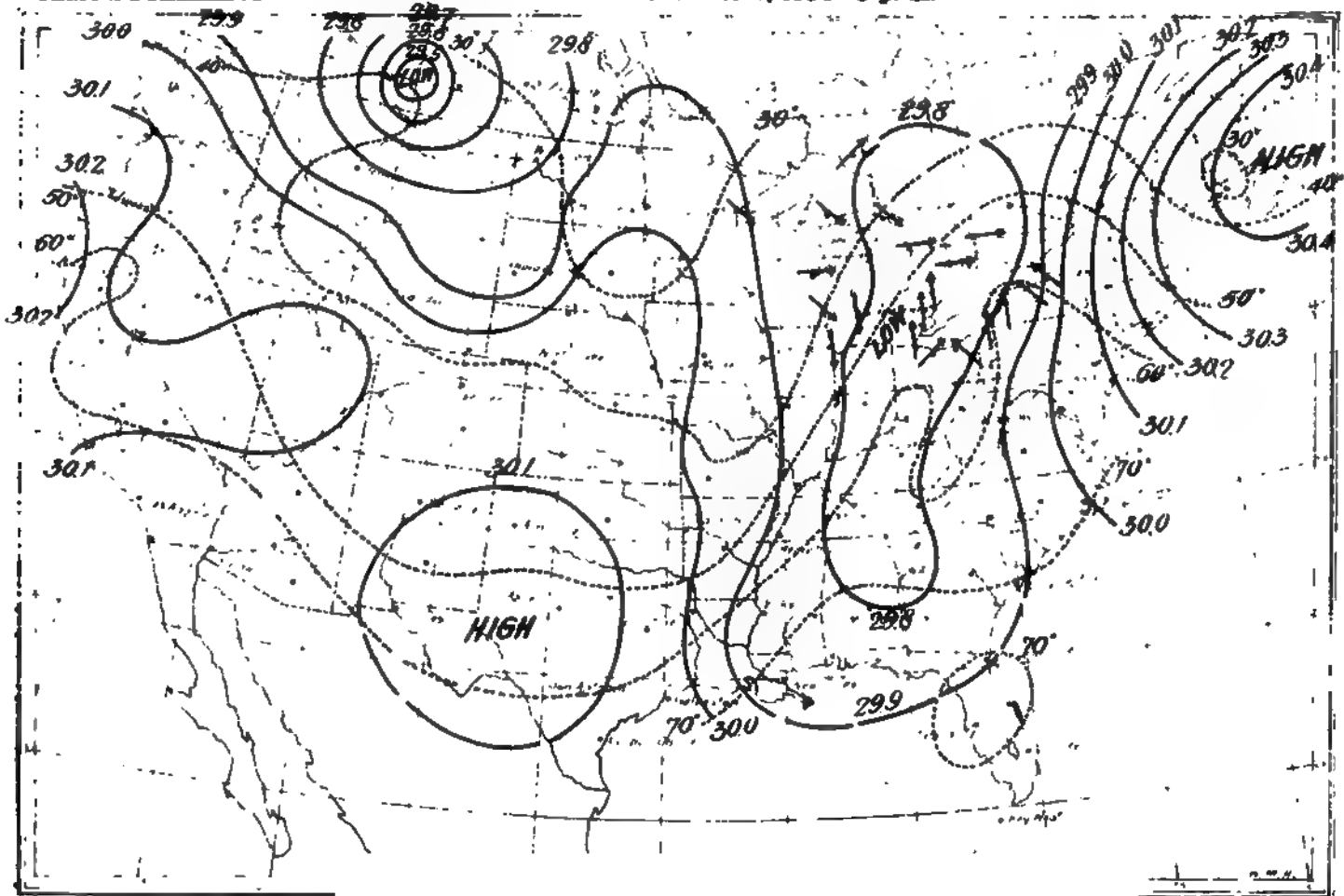


Chart DOOLXXXVI.

November 4, 1896—8 p. m.



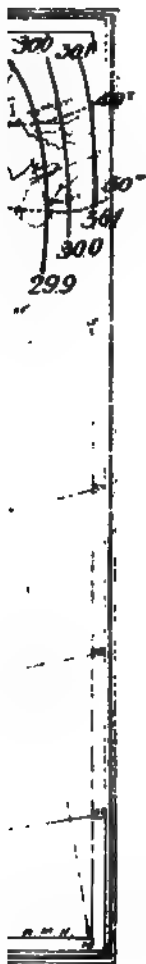


Chart DOOLXXXIX.

November 4, 1897—8 a. m.

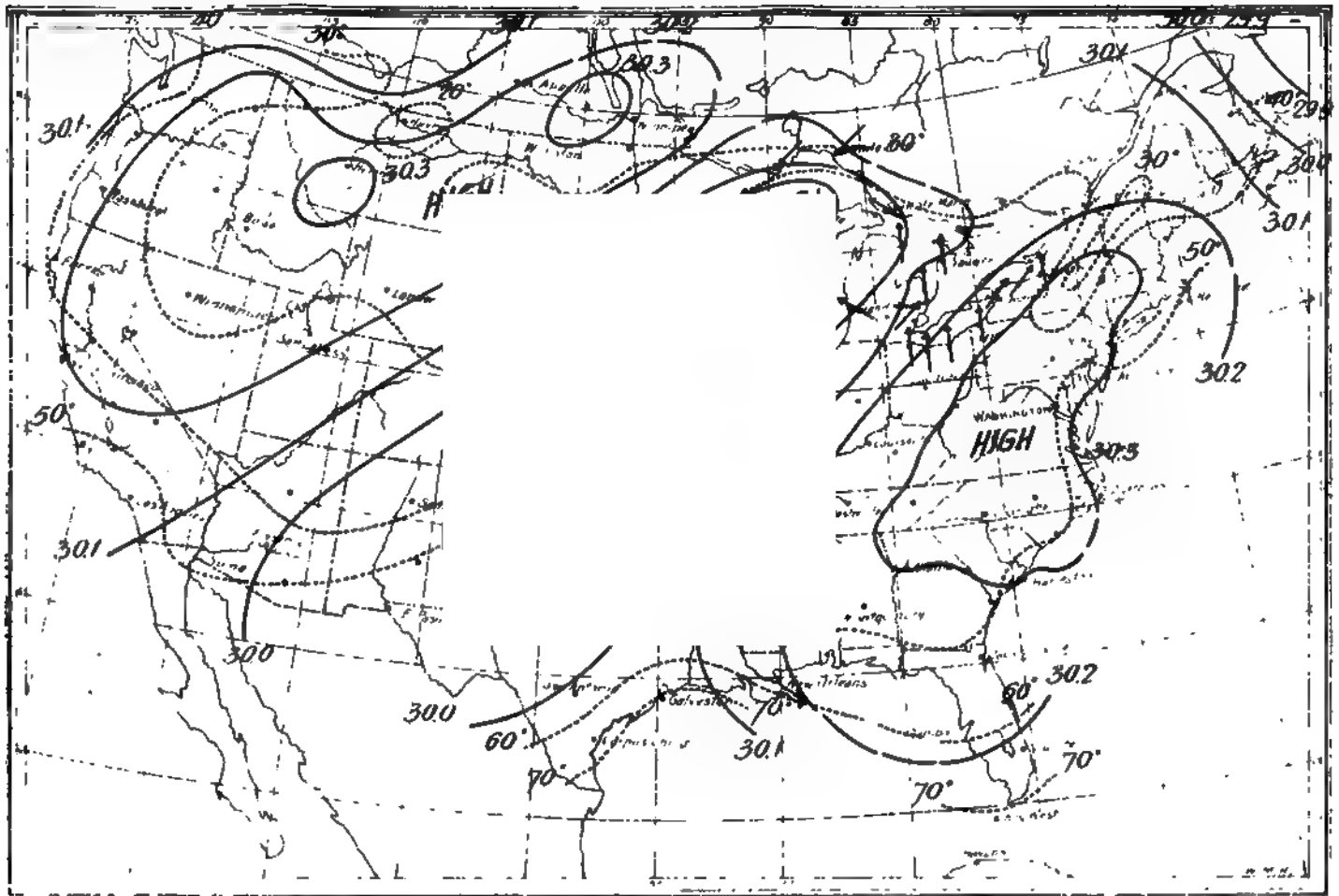


Chart DOOLXCO.

November 4, 1897—8 p. m.

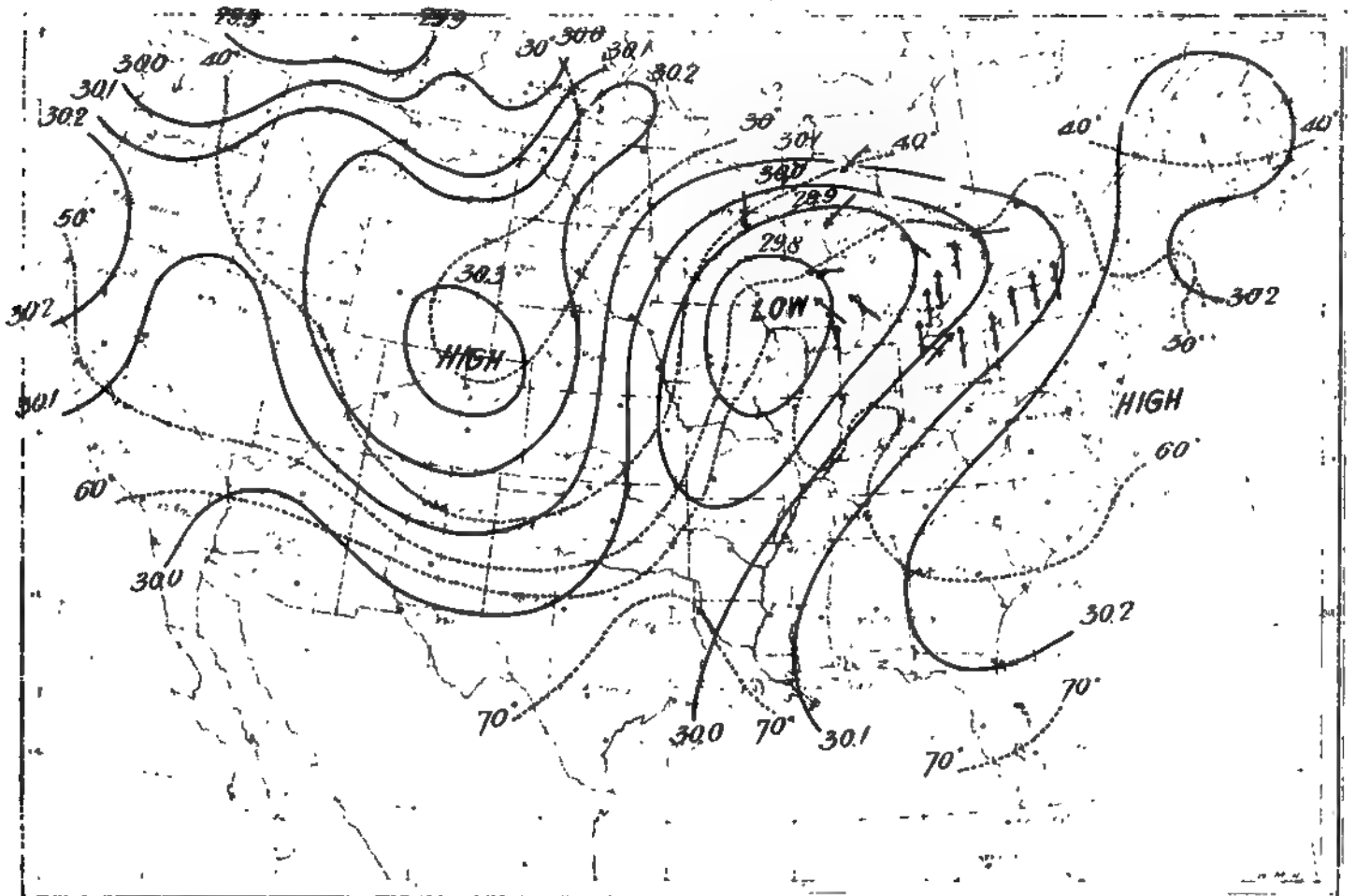


Chart DOOXOI.

November 5, 1897—8 a. m.

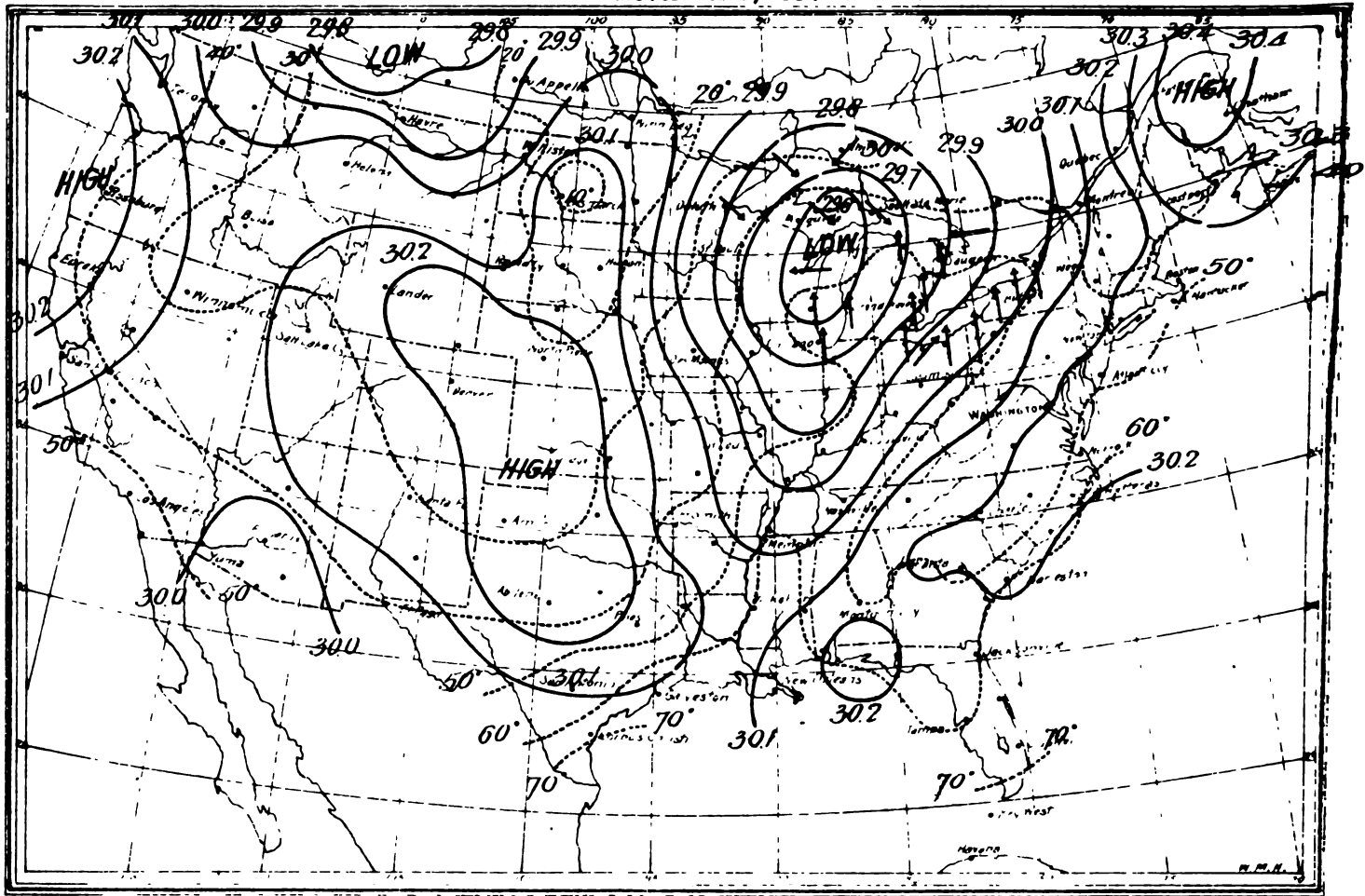


Chart DOOXOII.

November 5, 1897—8 p. m.

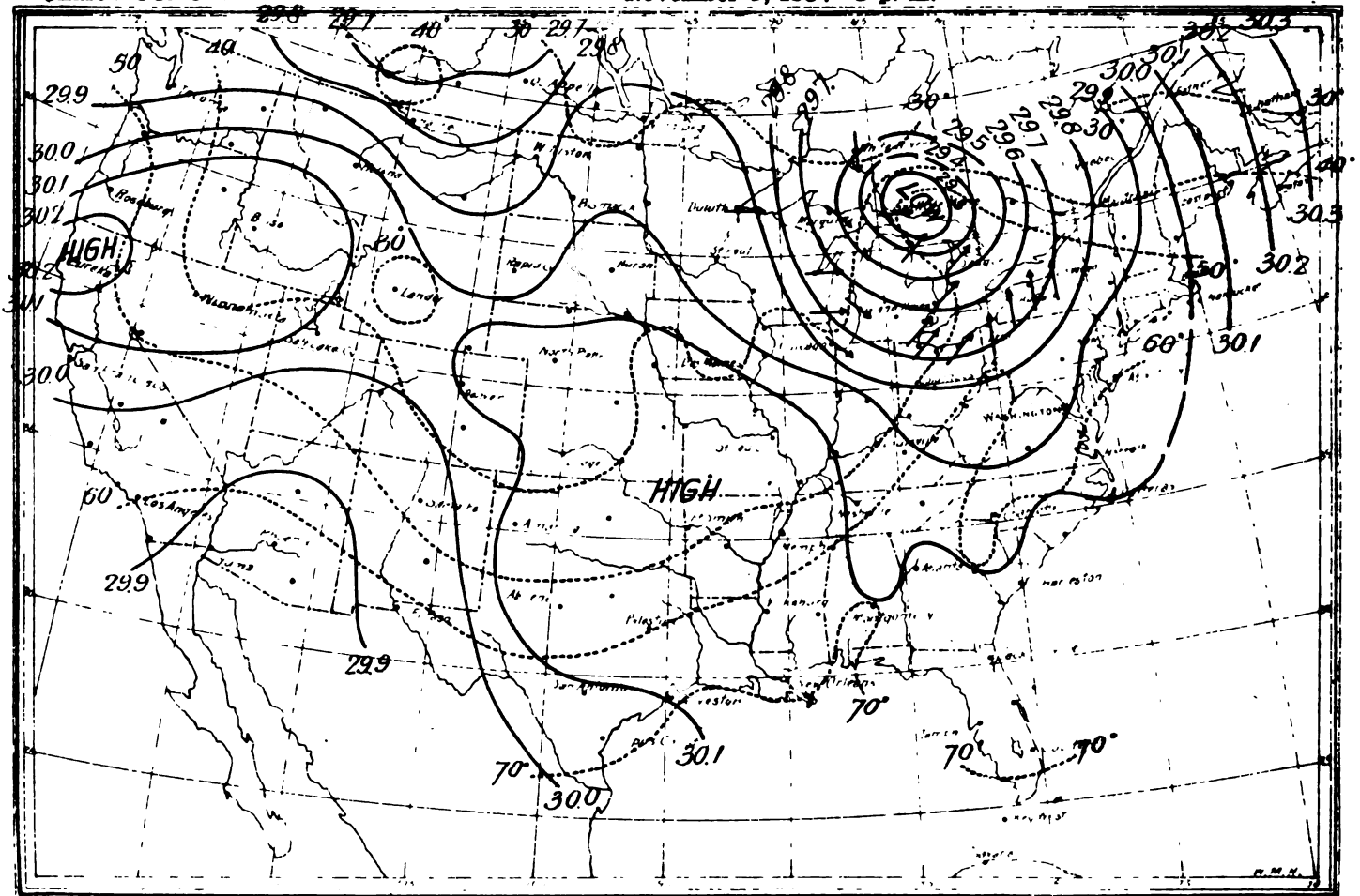


Chart DOCKOIII.

November 8, 1897—8 a. m.

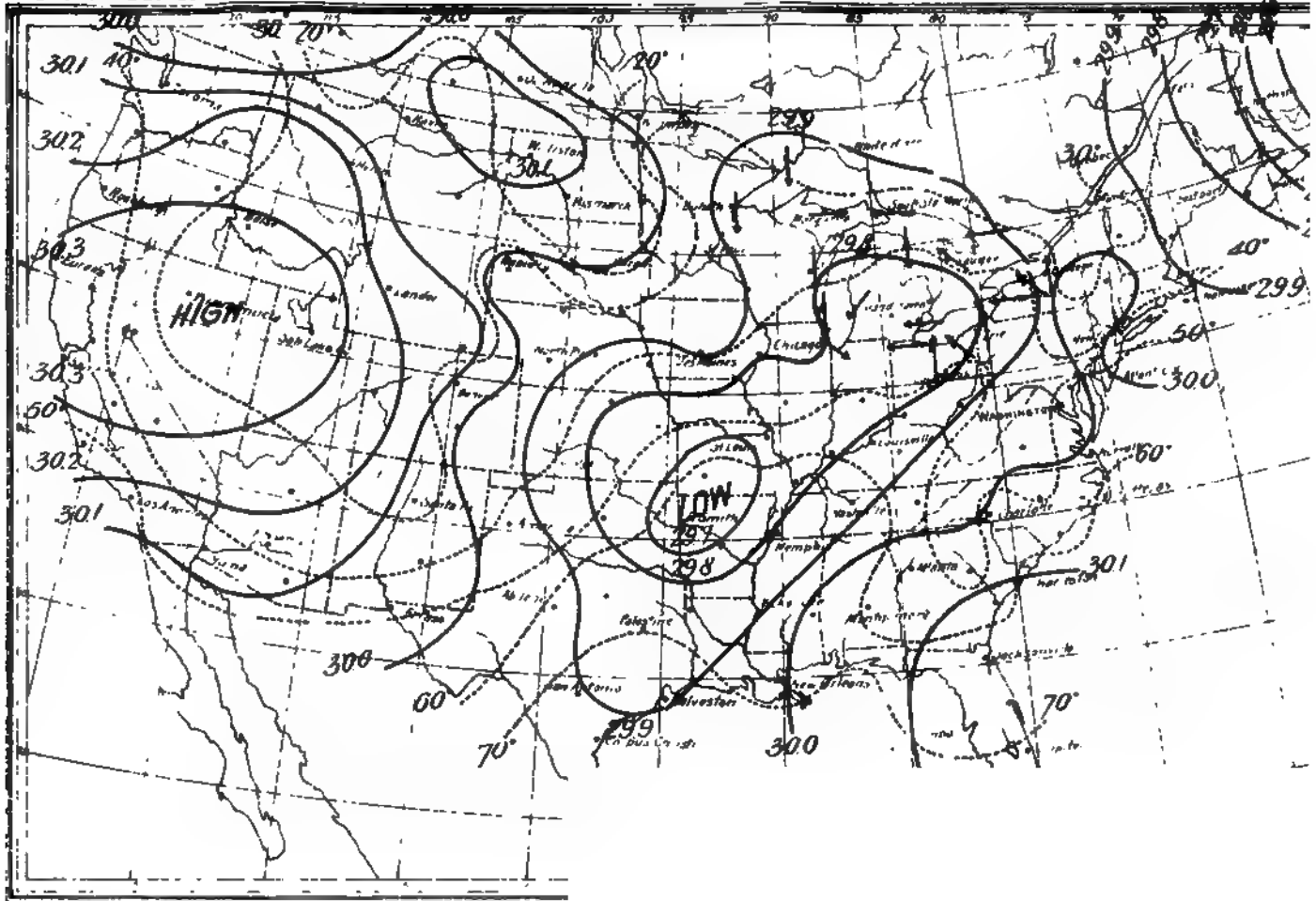


Chart DOCKOIV.

November 8, 1897—8 p. m.

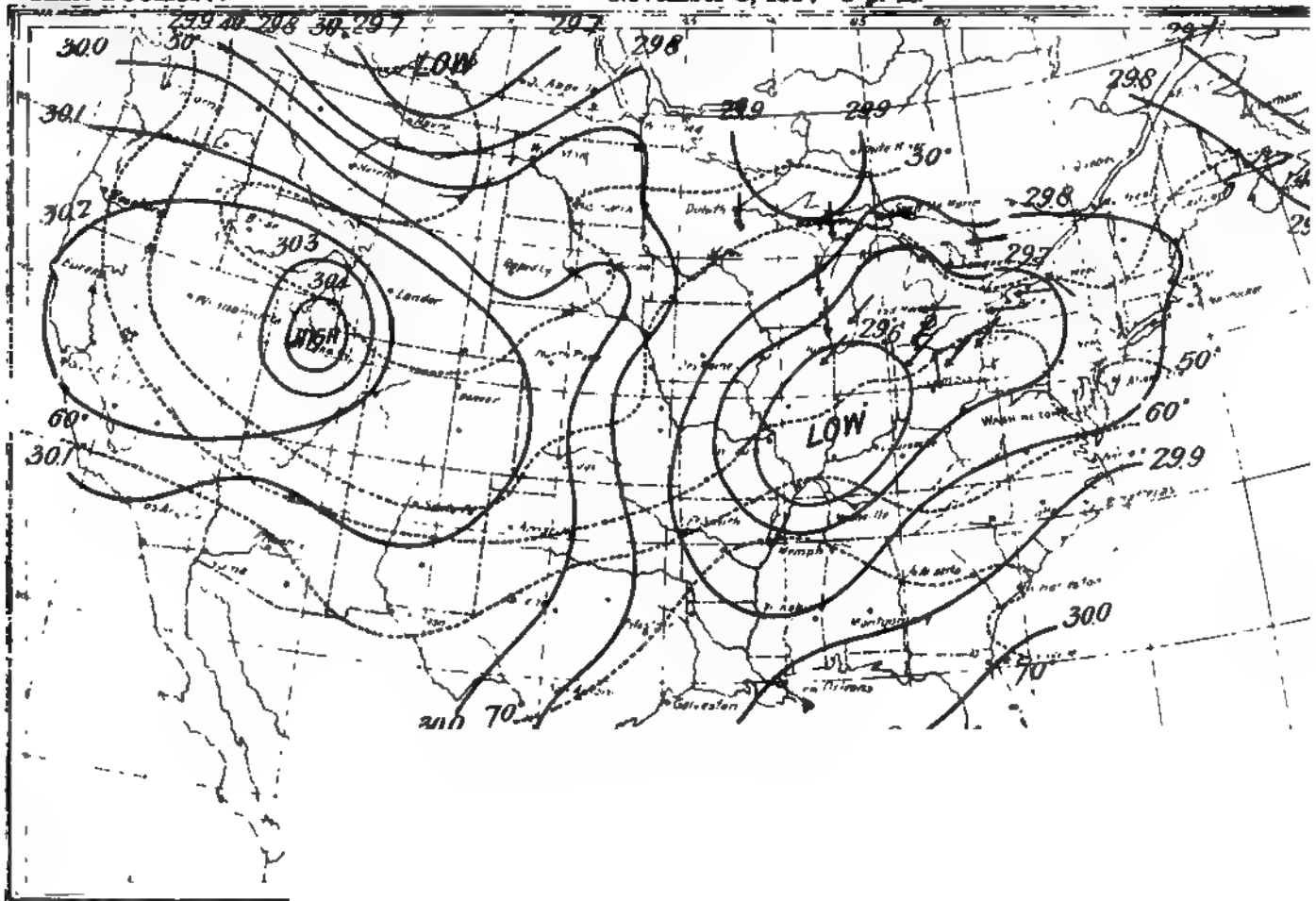


Chart DOCKOVII.

November 10, 1897—8 a. m.

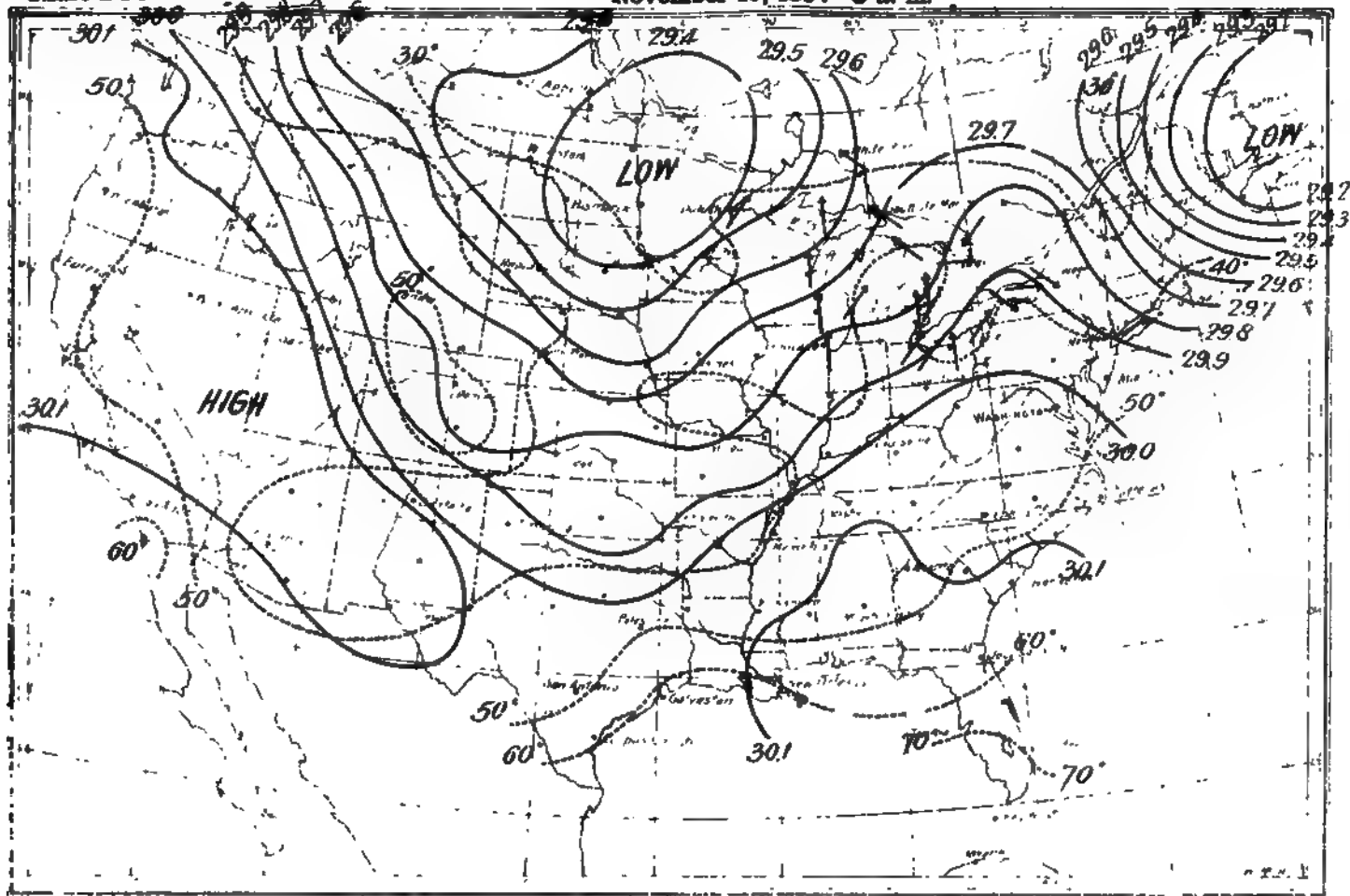


Chart DOCKOVIII.

November 10, 1897—8 p. m.

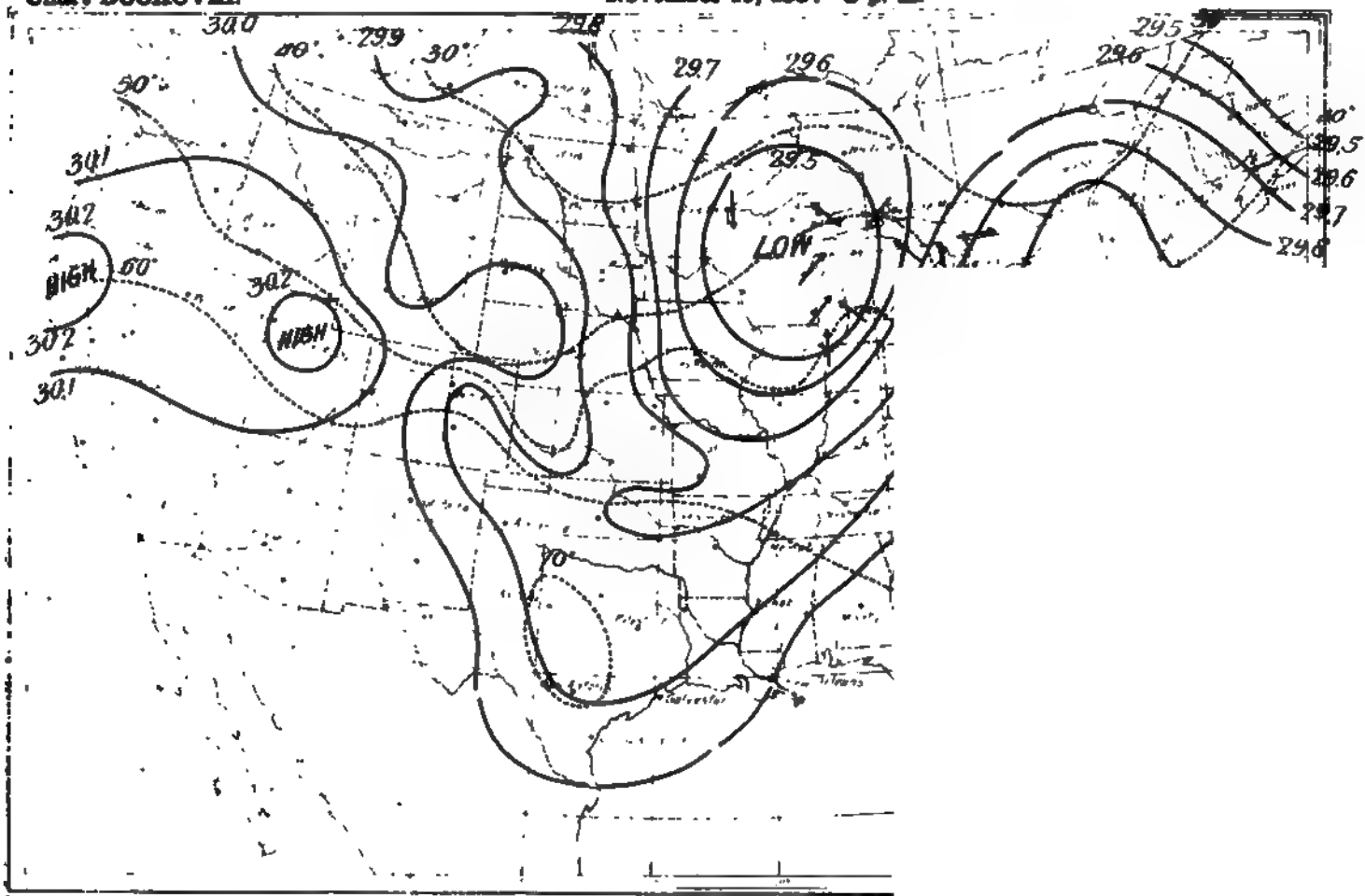


Chart DCOXIX.

November 11, 1897—8 a. m.

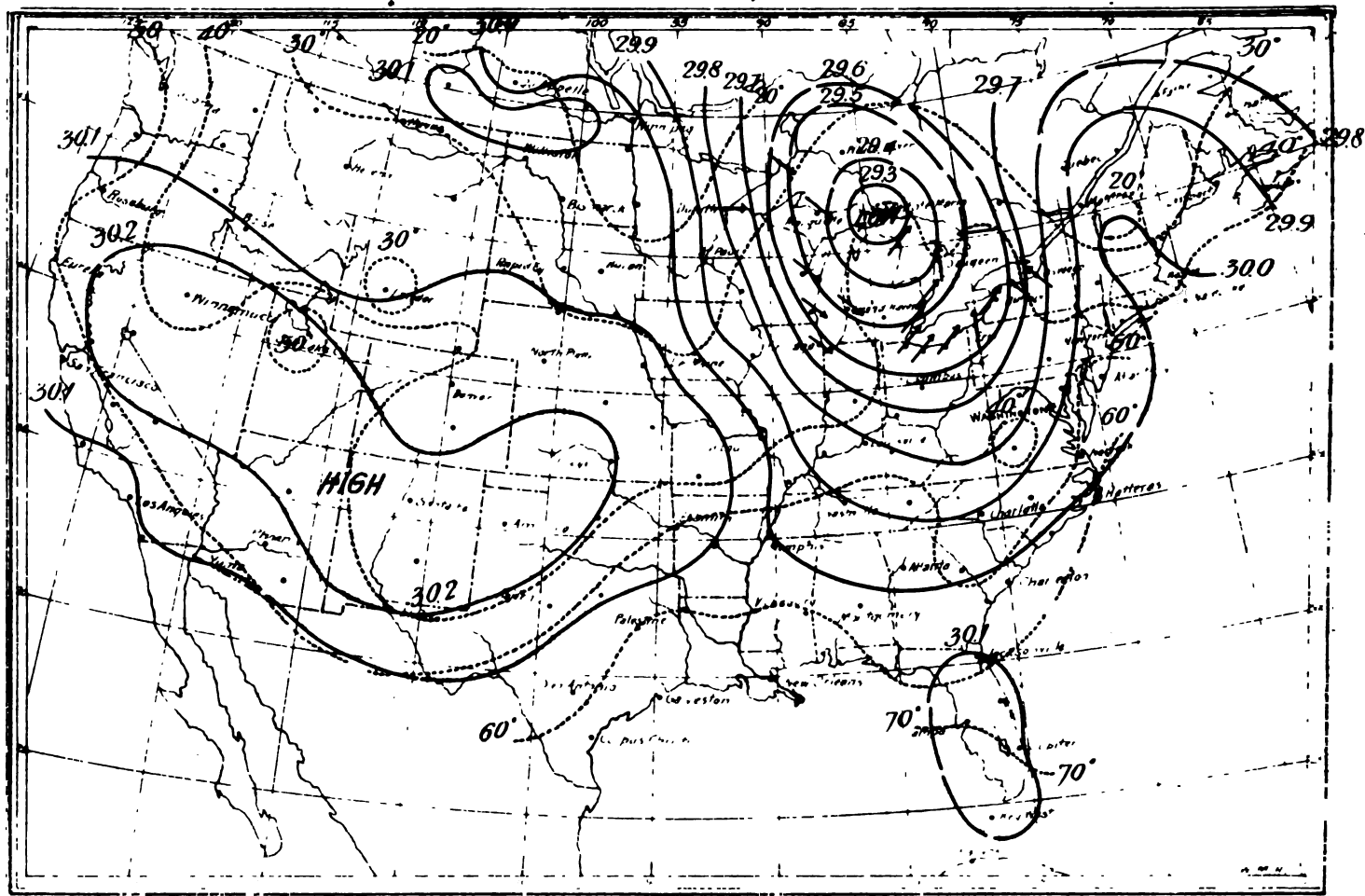


Chart DCOO.

November 11, 1897—8 p. m.

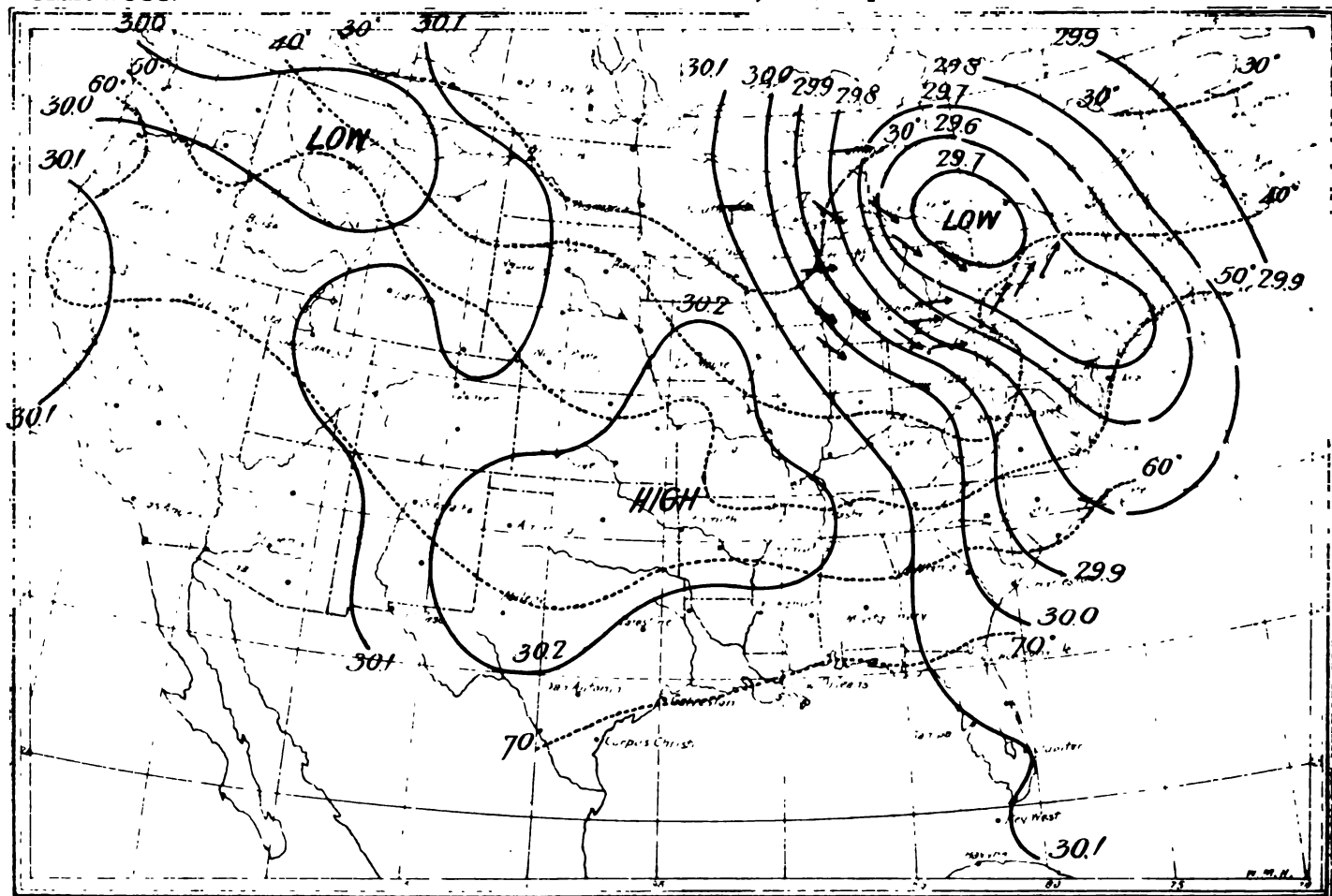


Chart D0001.

November 1, 1898—8 a. m.

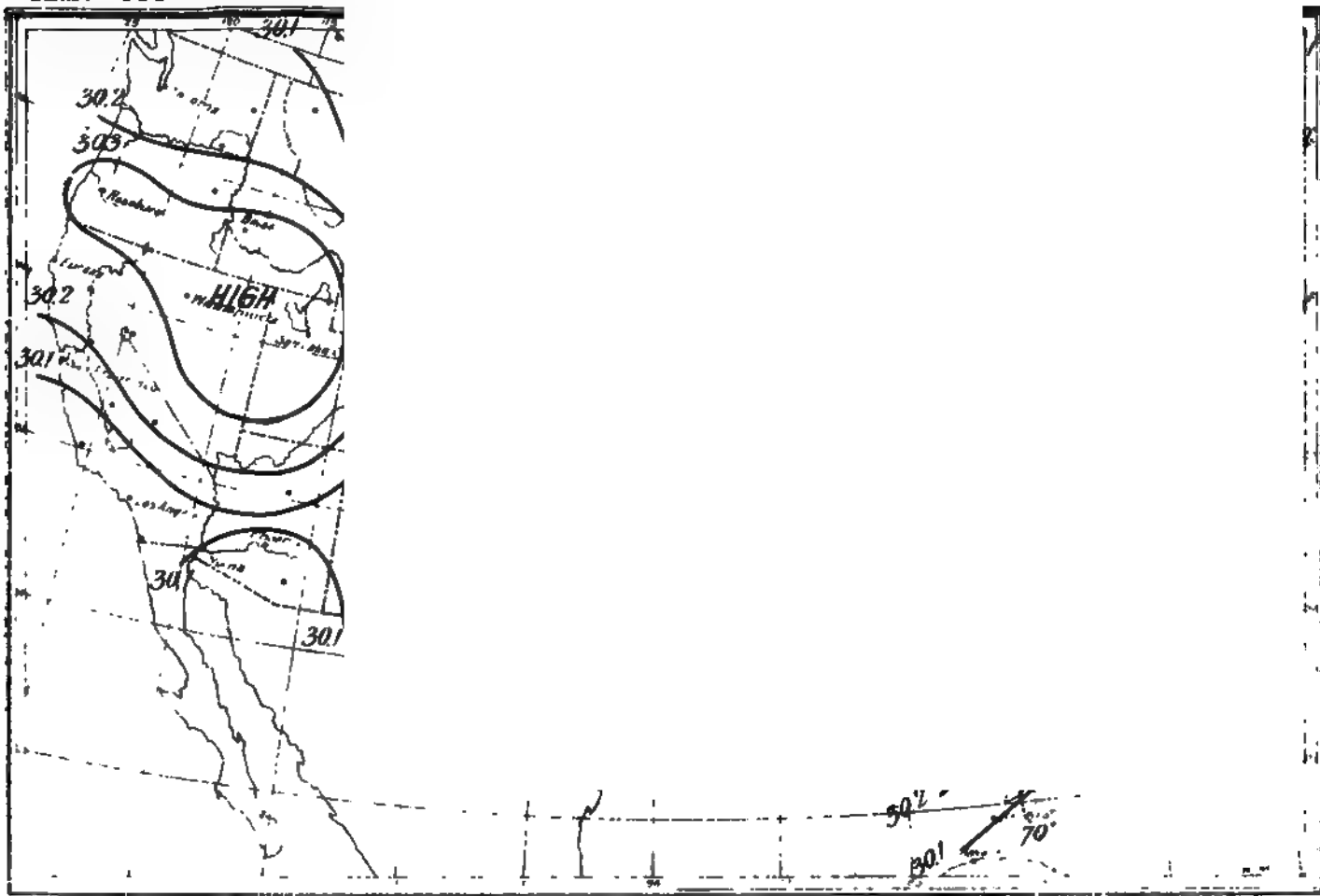


Chart D0002.

November 1, 1898—8 p. m.

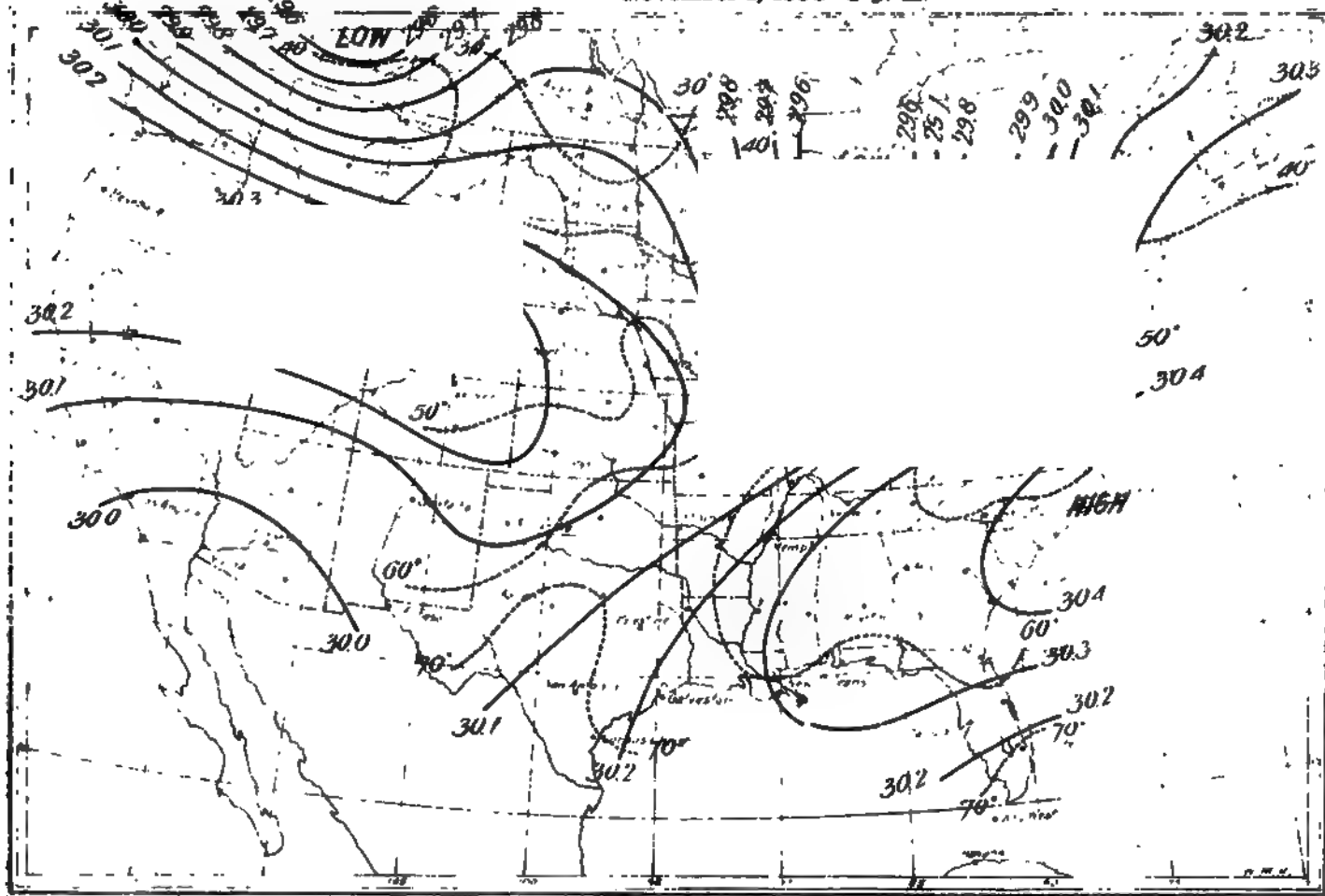


Chart DCCCCIII.

November 2, 1898—8 a. m.

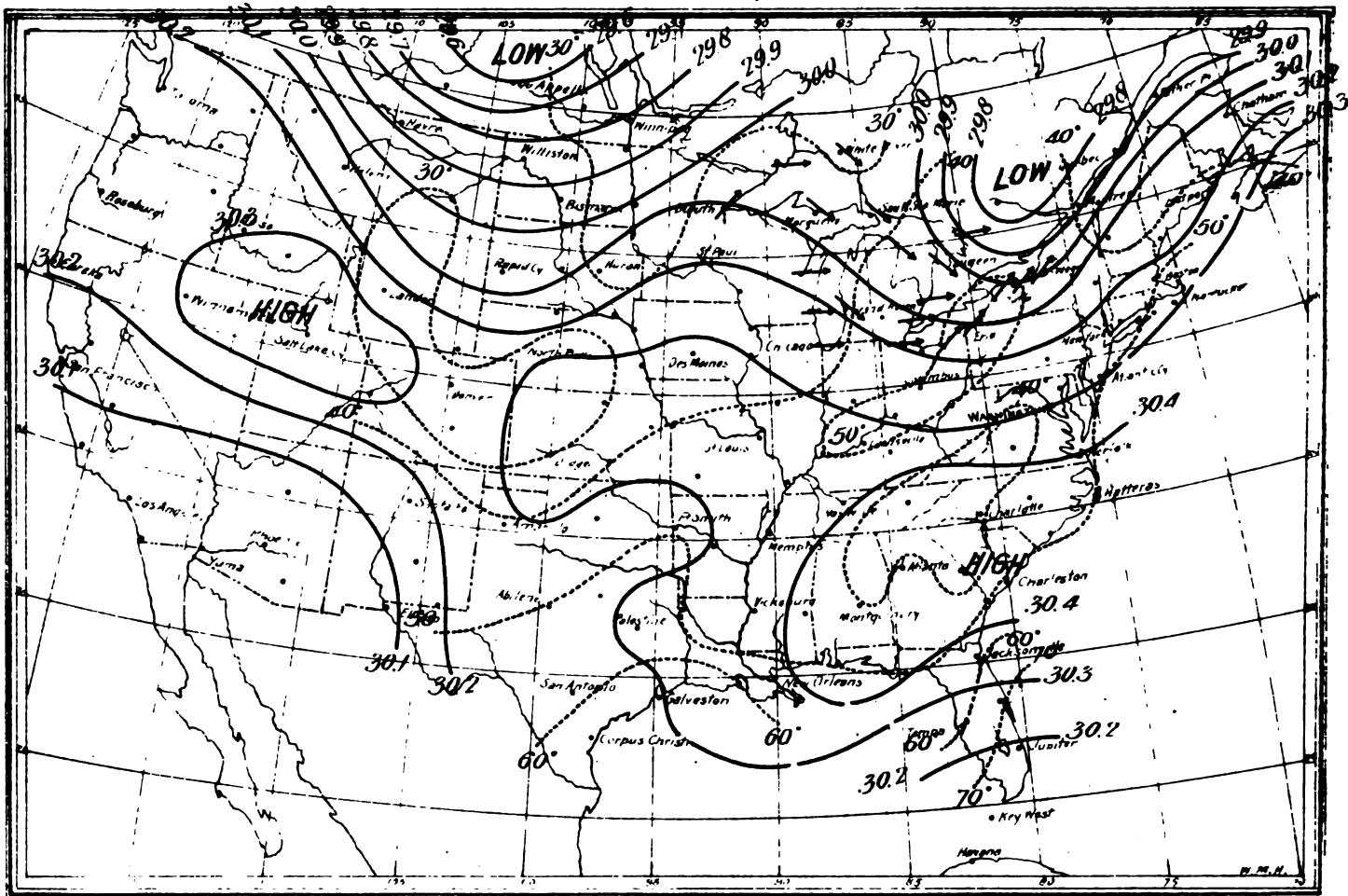


Chart DCCCCIV.

November 2, 1898—8 p. m.

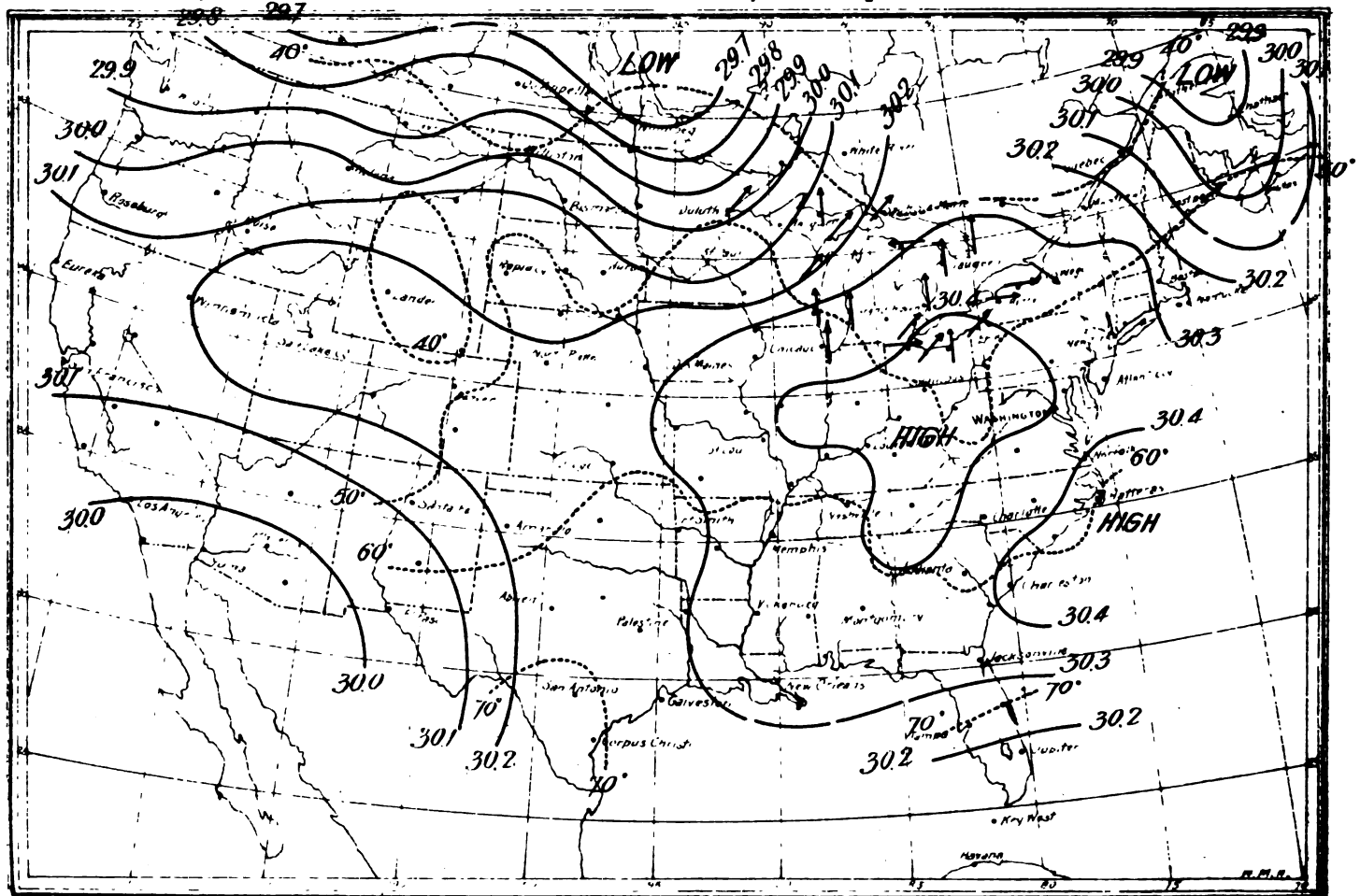


Chart D000V.

November 4, 1898—8 a. m.

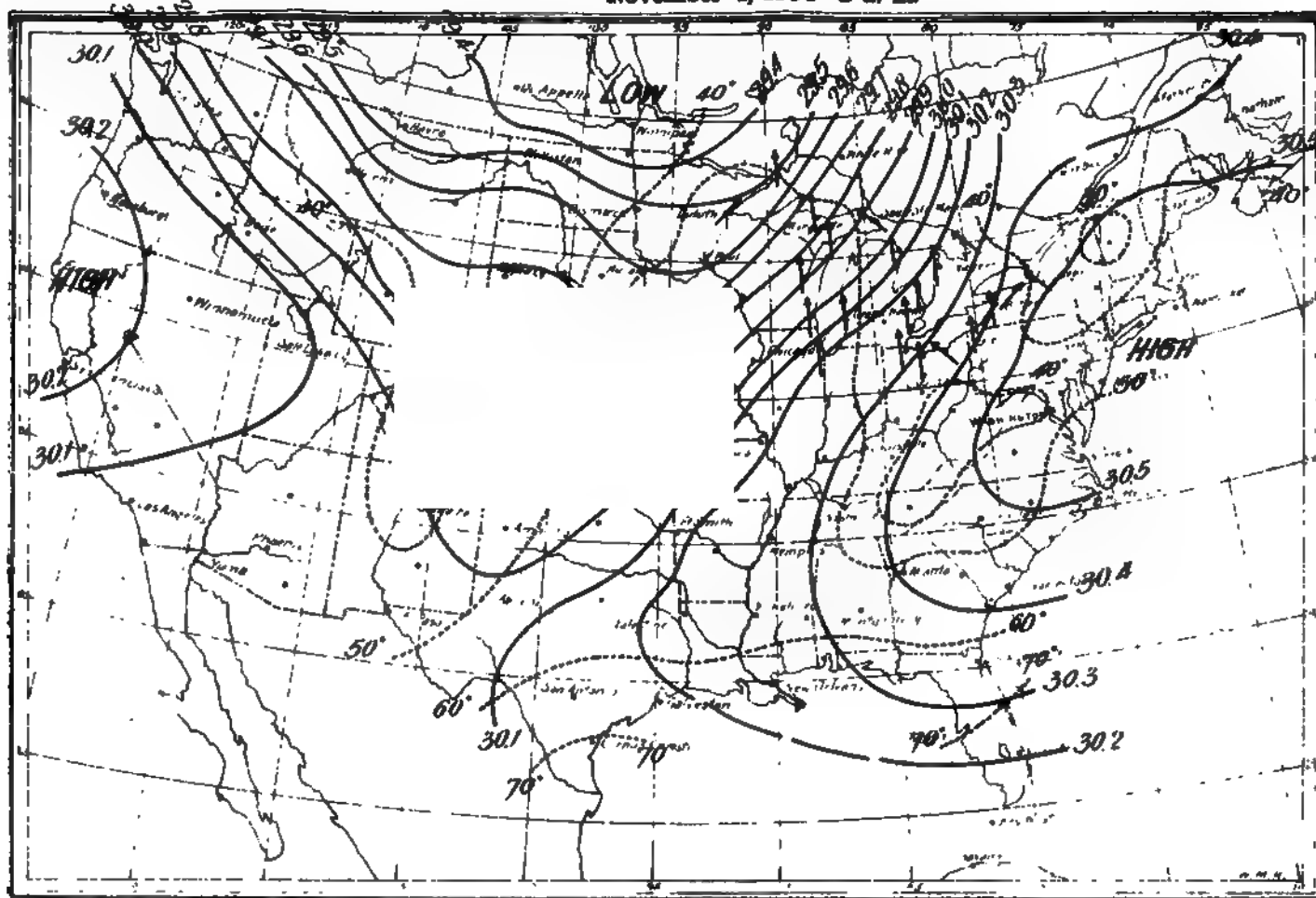


Chart D000VI.

November 4, 1898—8 p. m.

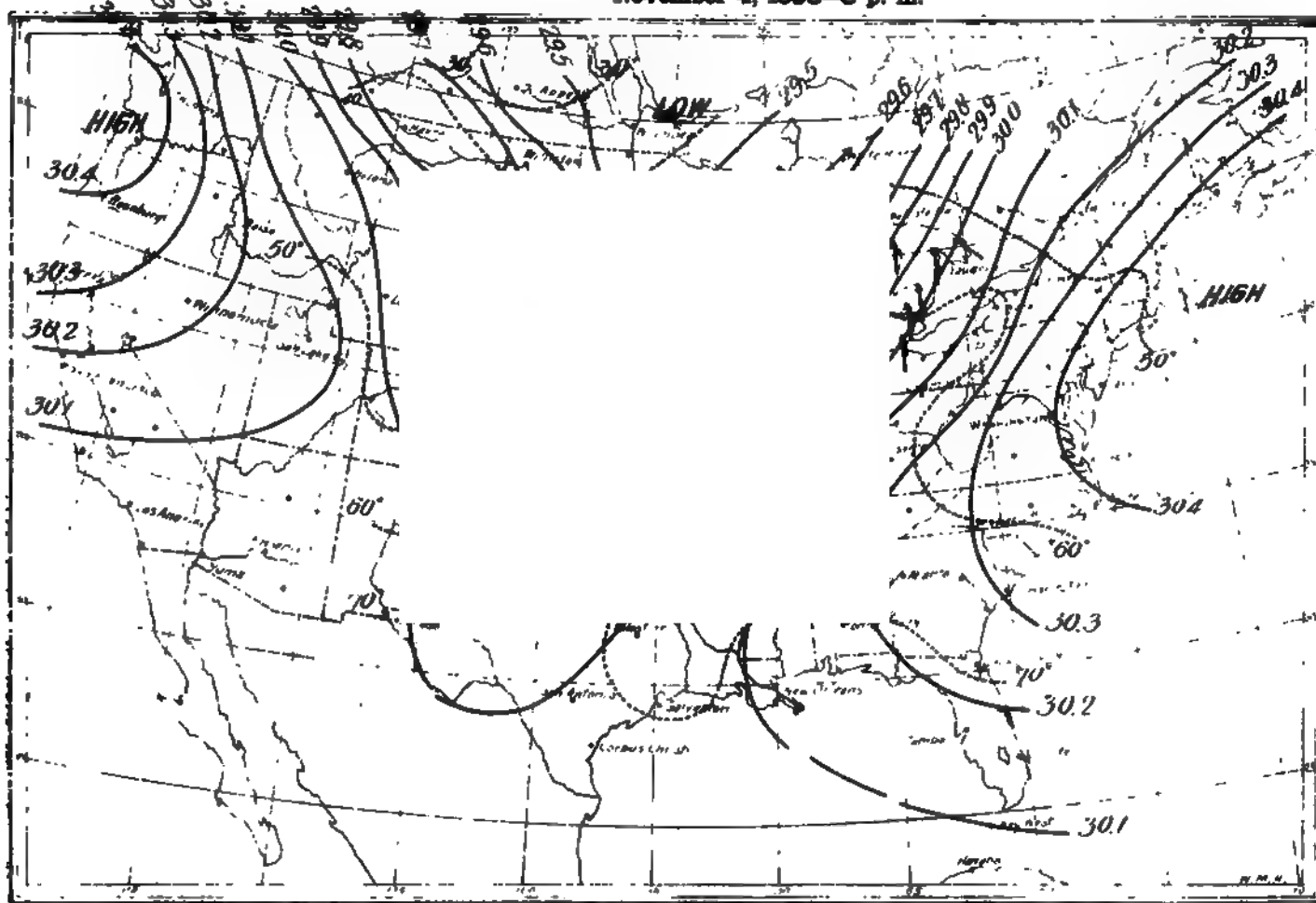


Chart DCCCVII.

November 5, 1898—8 a. m.

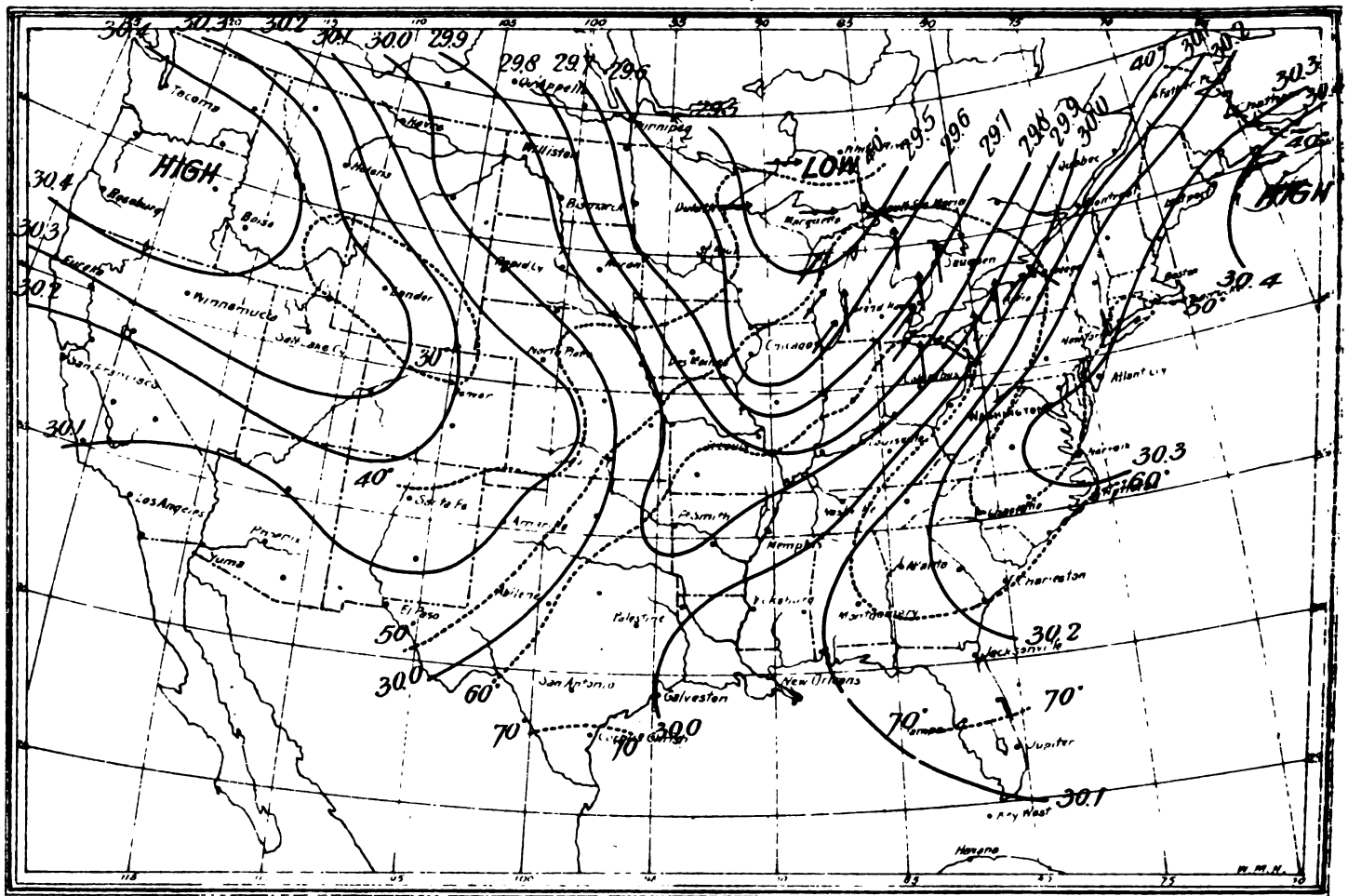


Chart DCCCVIII.

November 5, 1898—8 p. m.

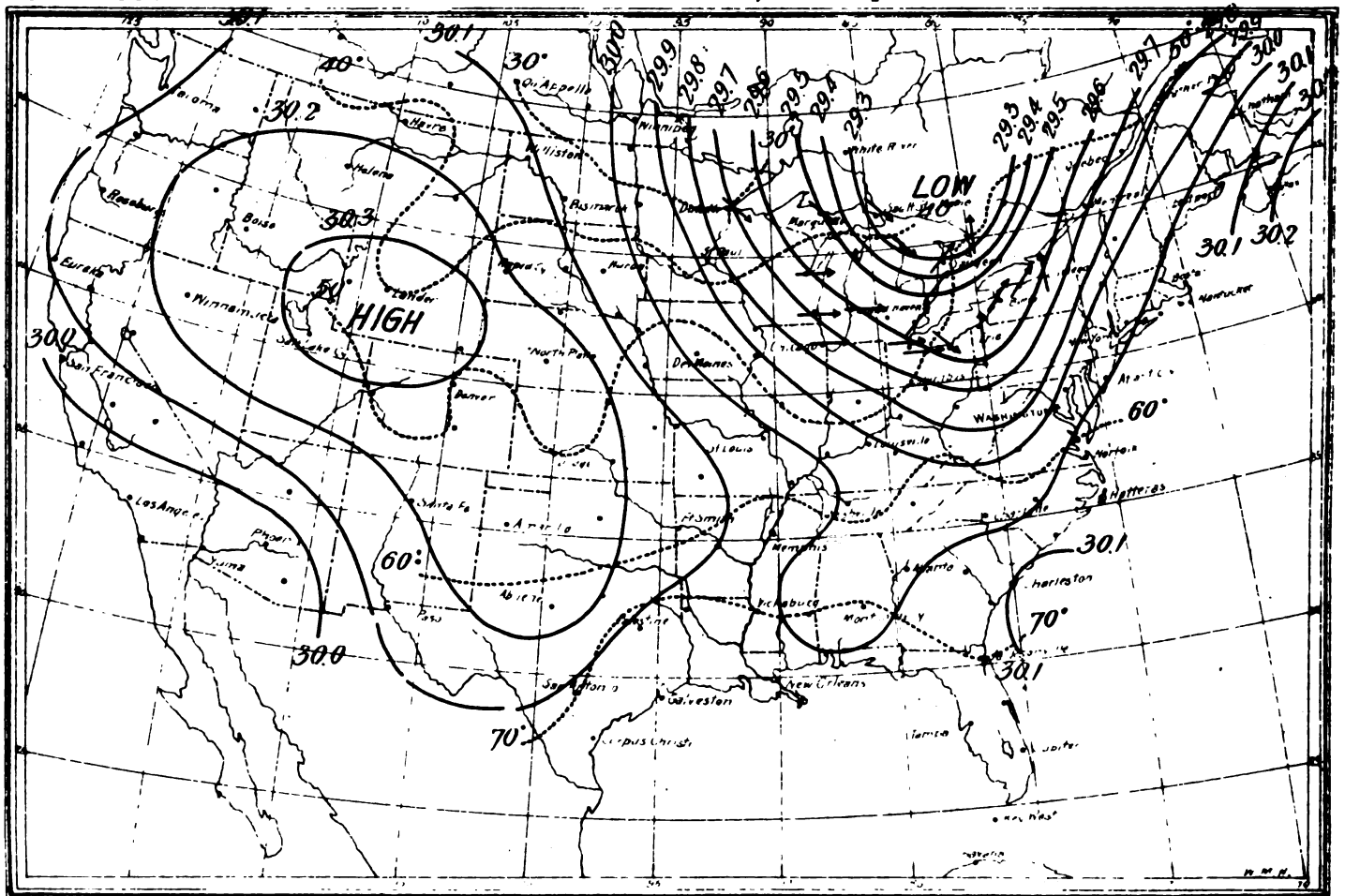


Chart D0001X.

November 7, 1898—8 a. m.

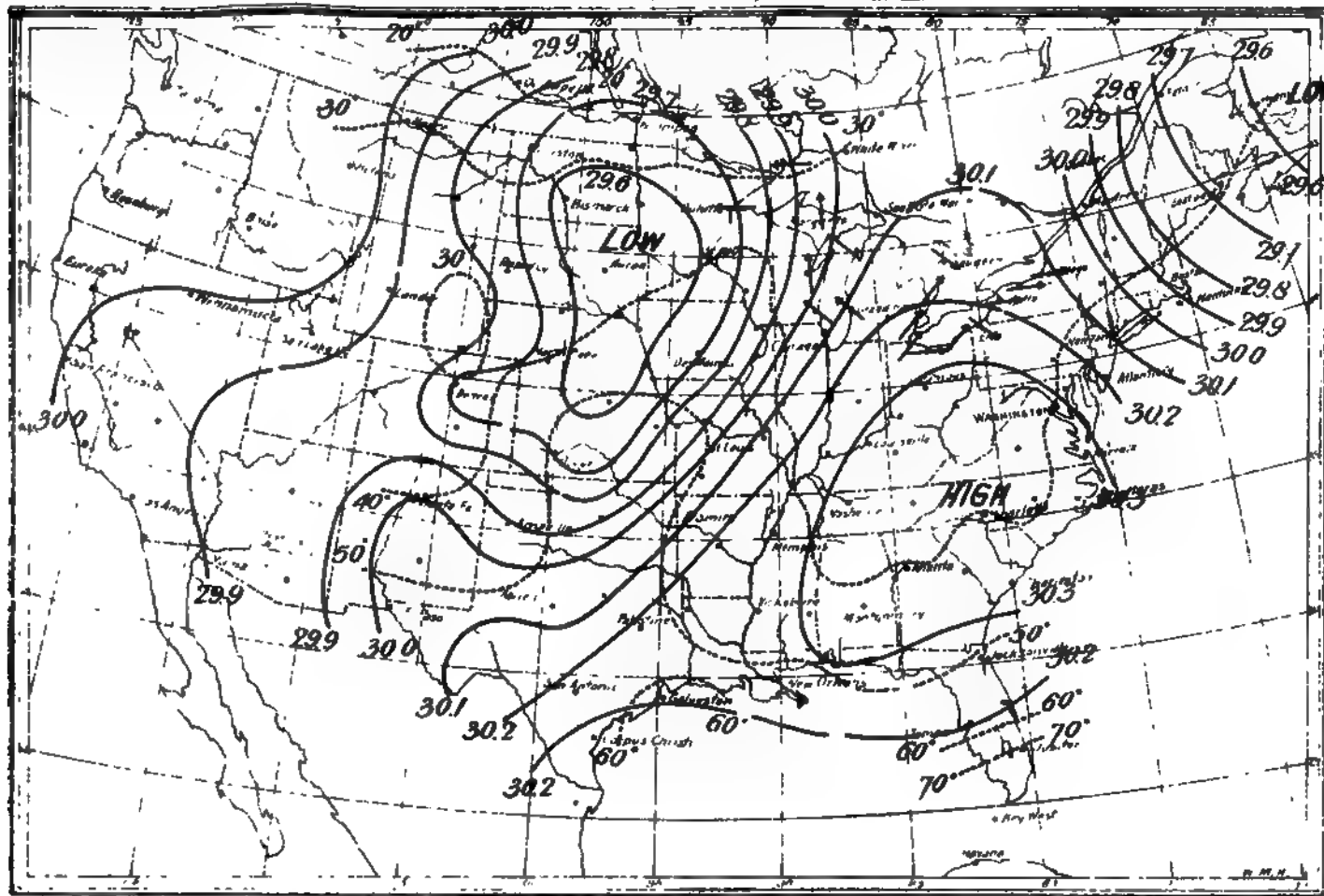


Chart D0002X.

November 7, 1898—8 p. m.

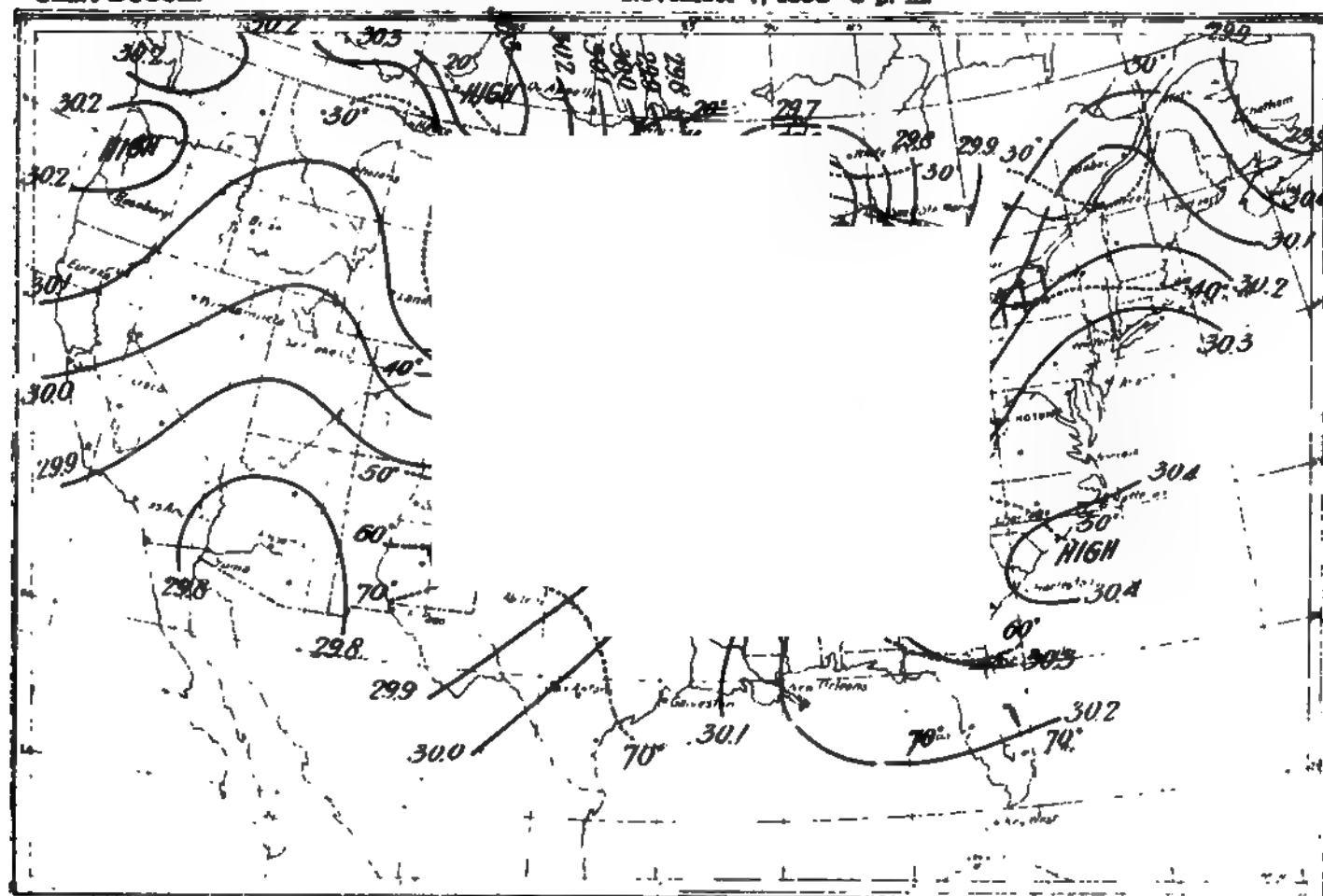


Chart D000XI.

November 8, 1898—8 a. m.

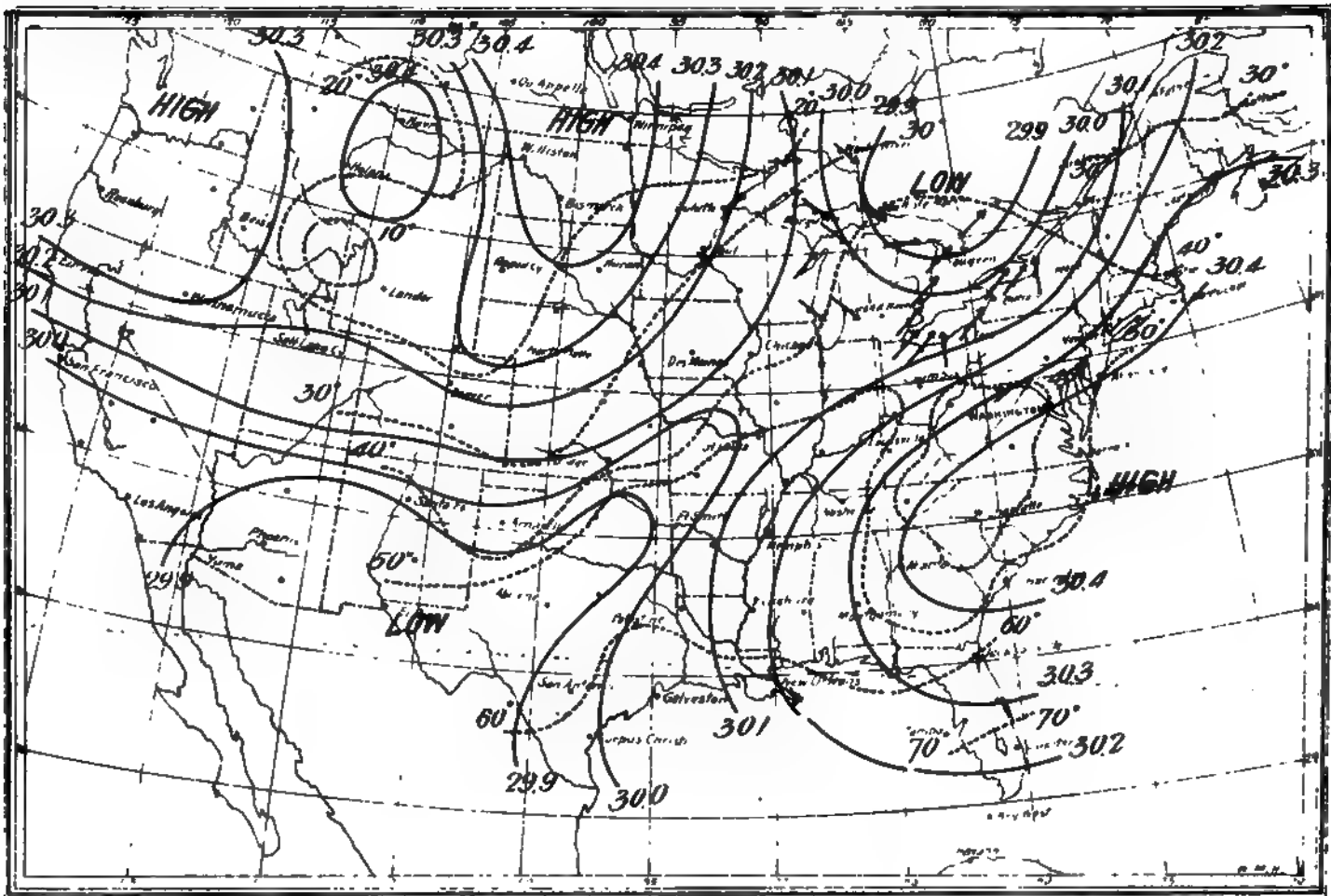


Chart D000XII.

November 8, 1898—8 p. m.

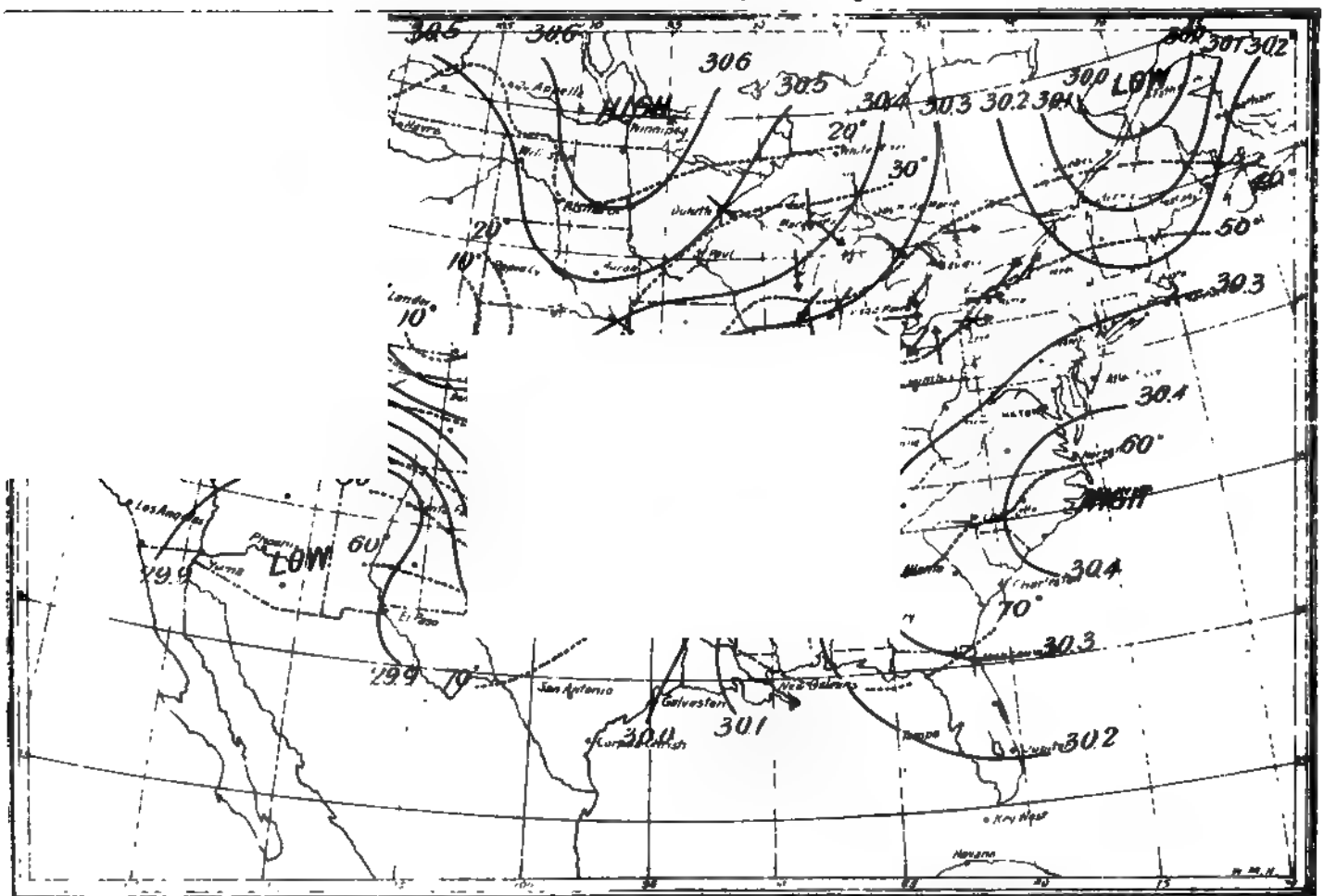


Chart DCOOXIII.

November 21, 1898—8 a. m.

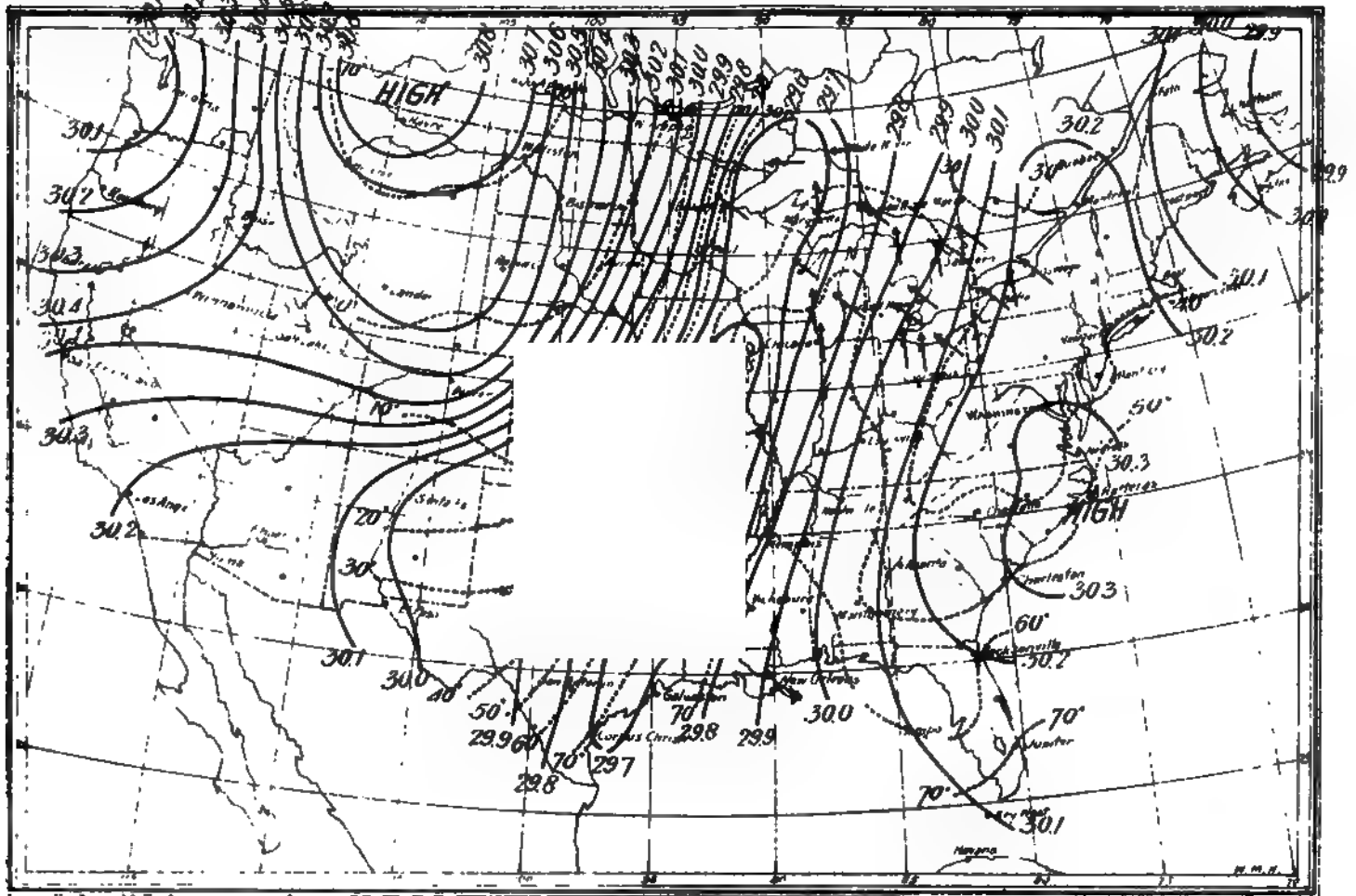
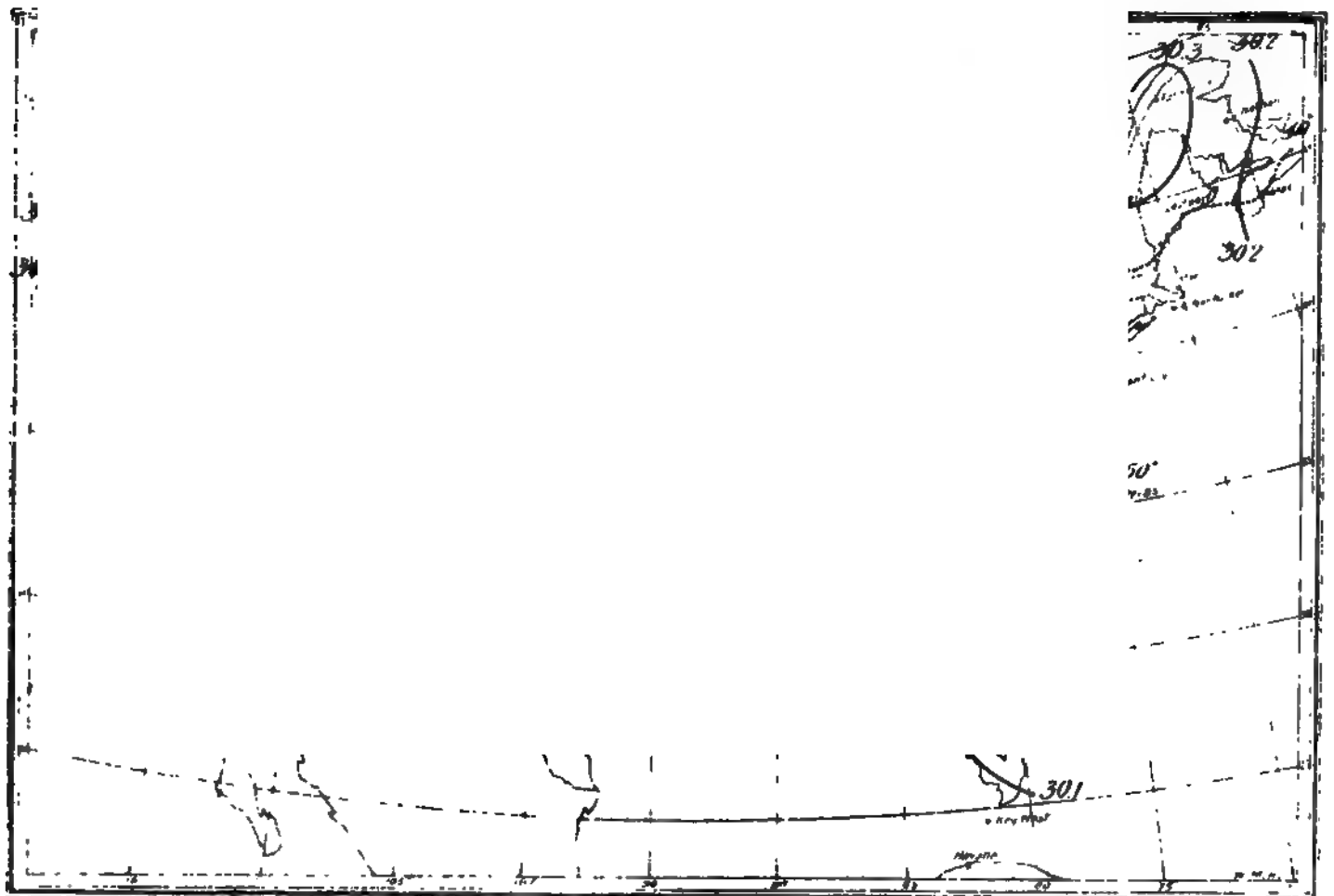


Chart DCOOXIV.

November 21, 1898—8 a. m.



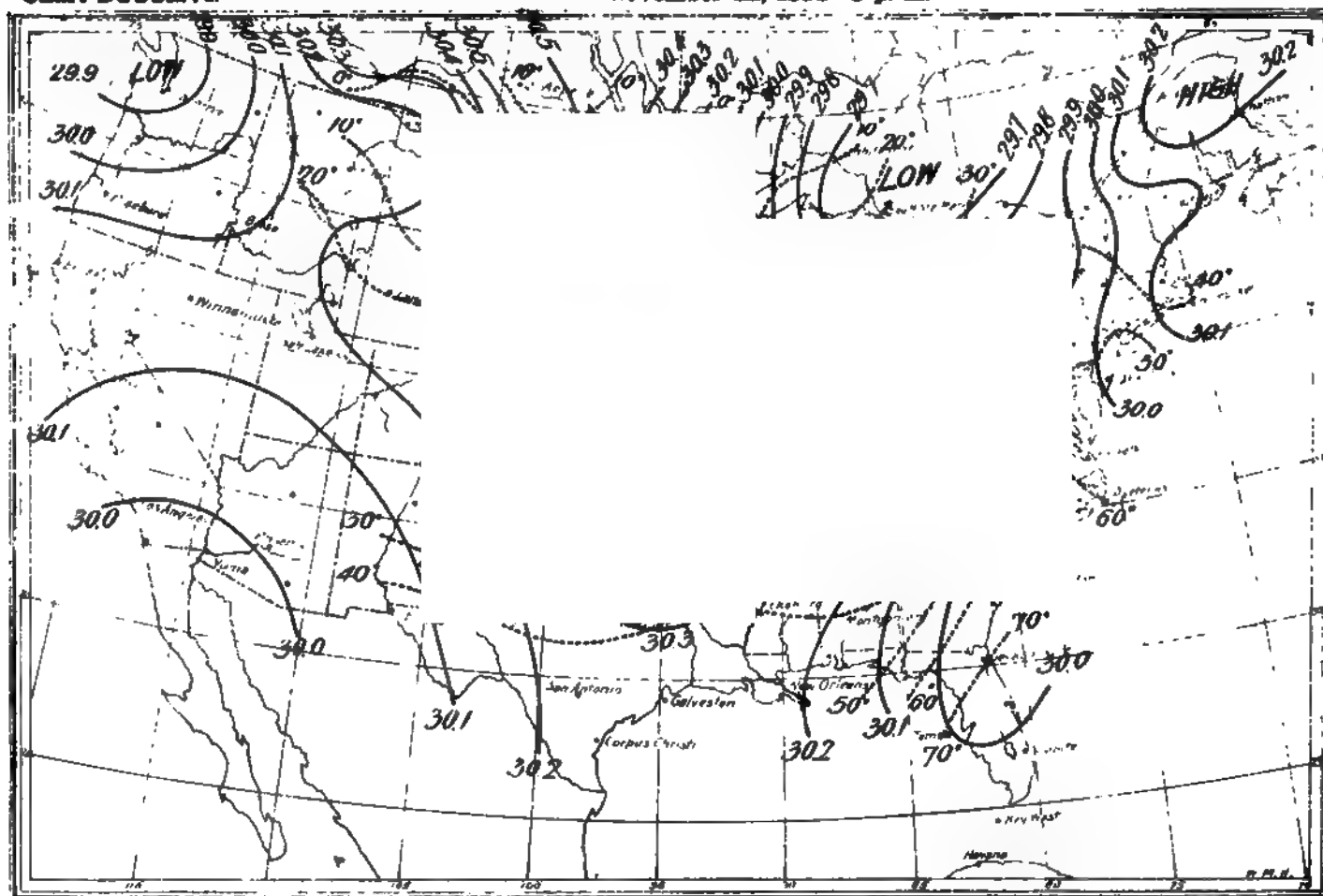
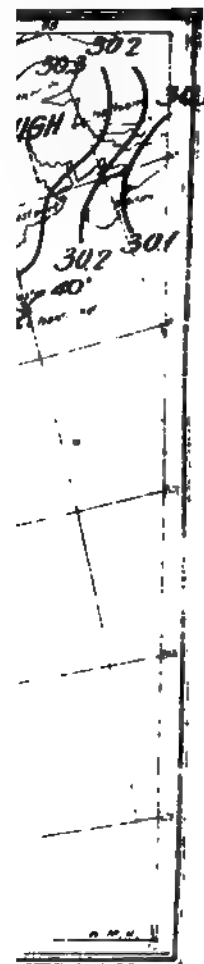


Chart DCOOXVII.

November 12, 1900—8 a. m.

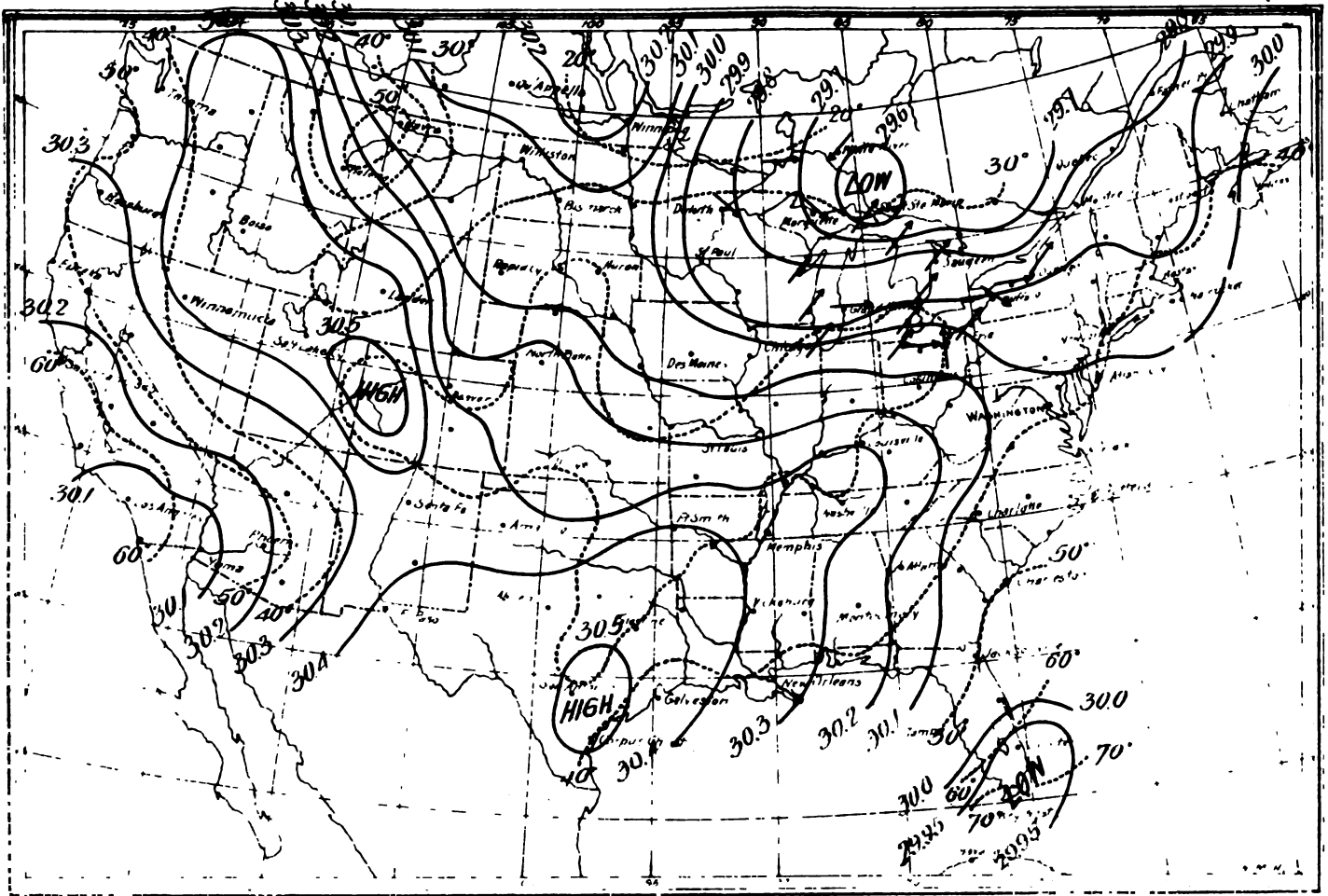


Chart DCOOXVIII.

November 12, 1900—8 p. m.

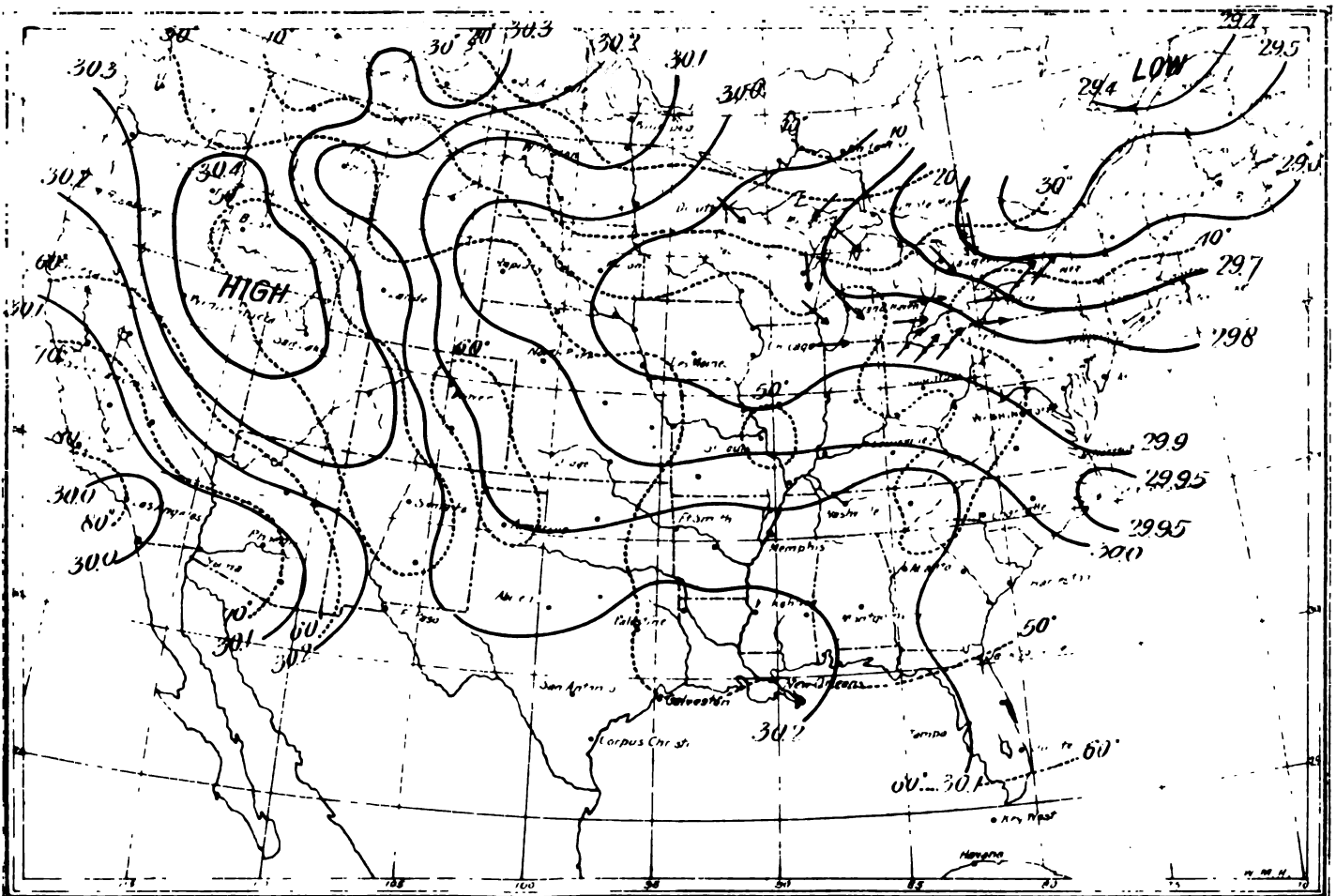


Chart D000XIX

November 13, 1900—8 a. m.

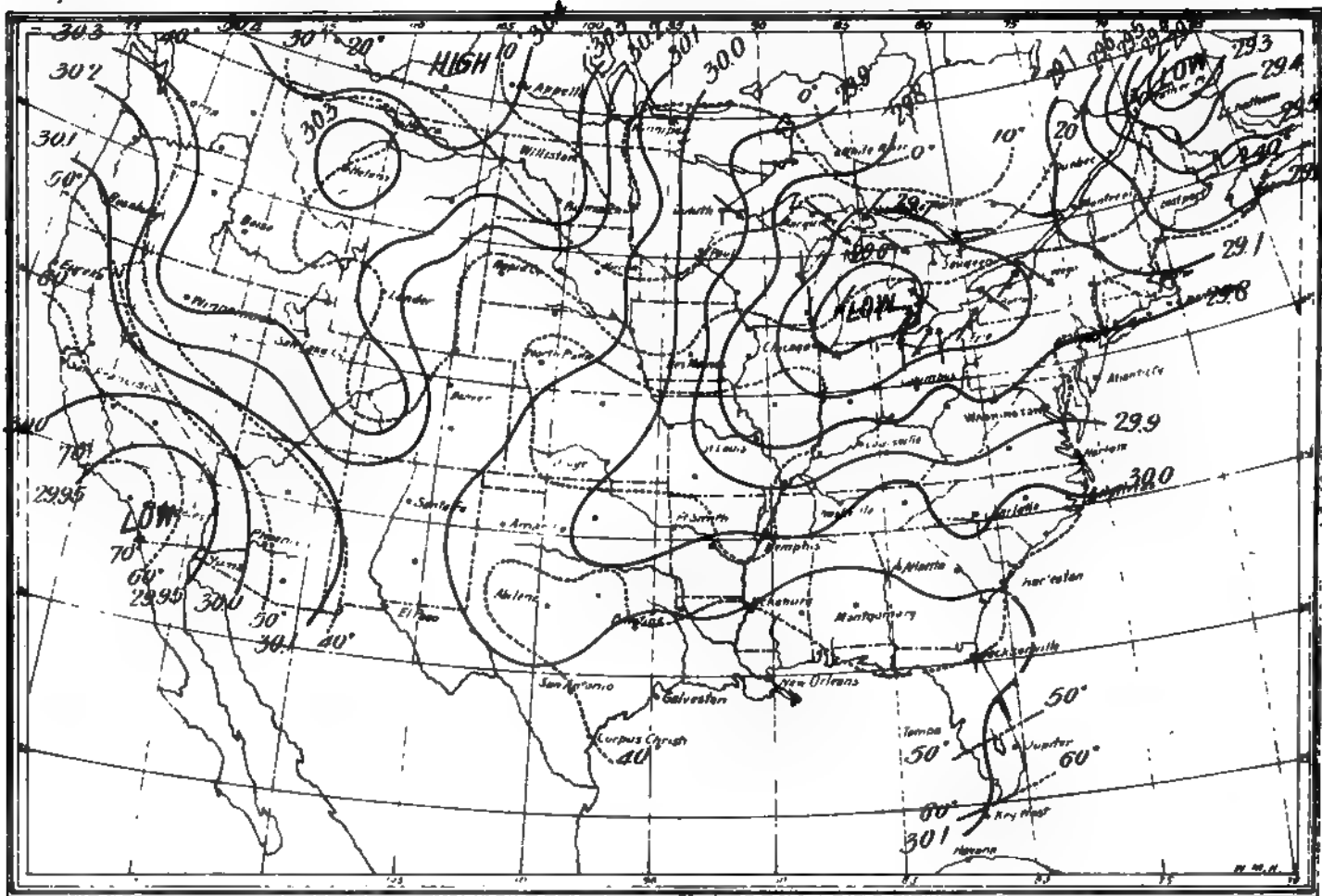


Chart D000XX

November 13, 1900—8 p. m.

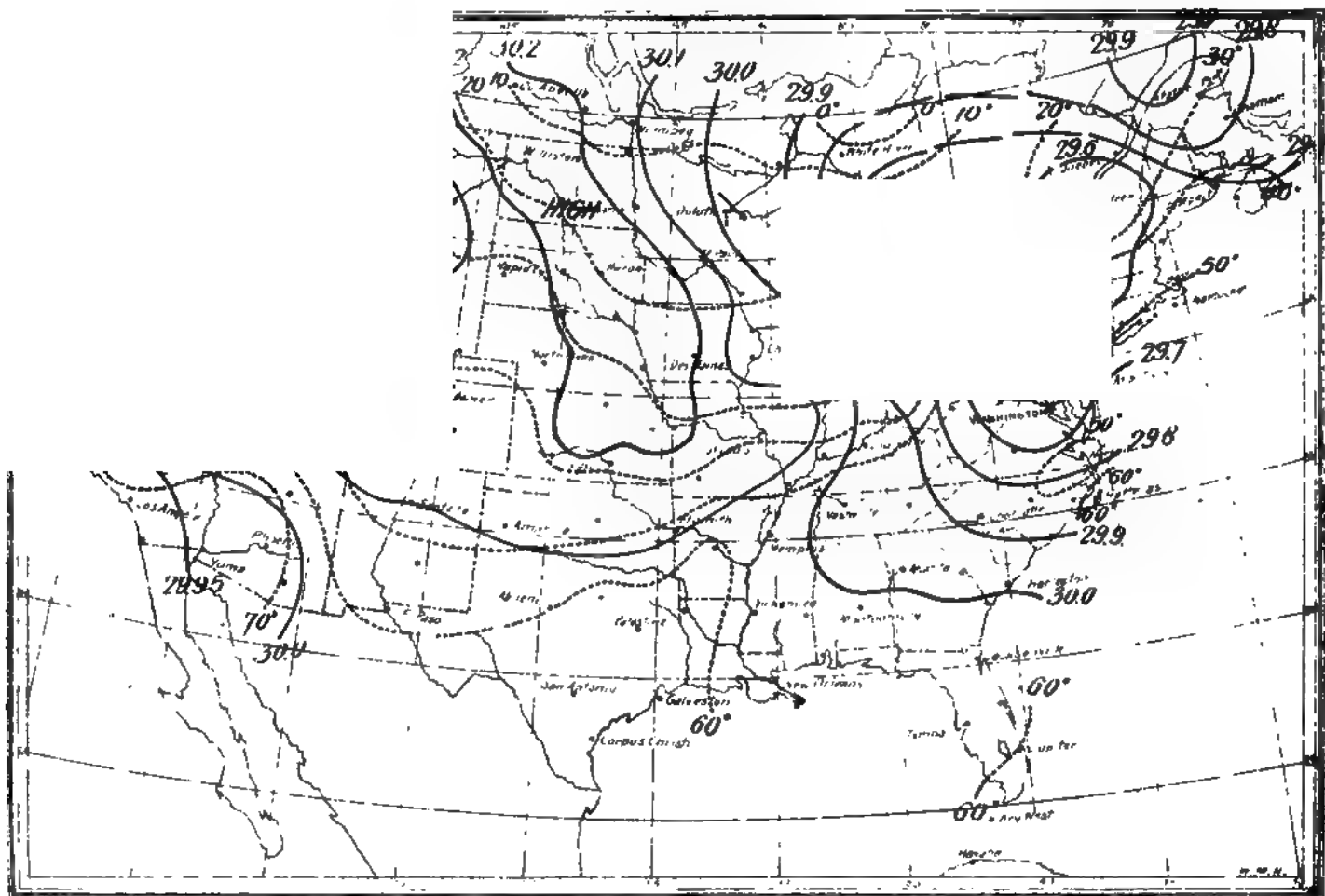


Chart DCOOXXI

November 18, 1900—8 a. m.

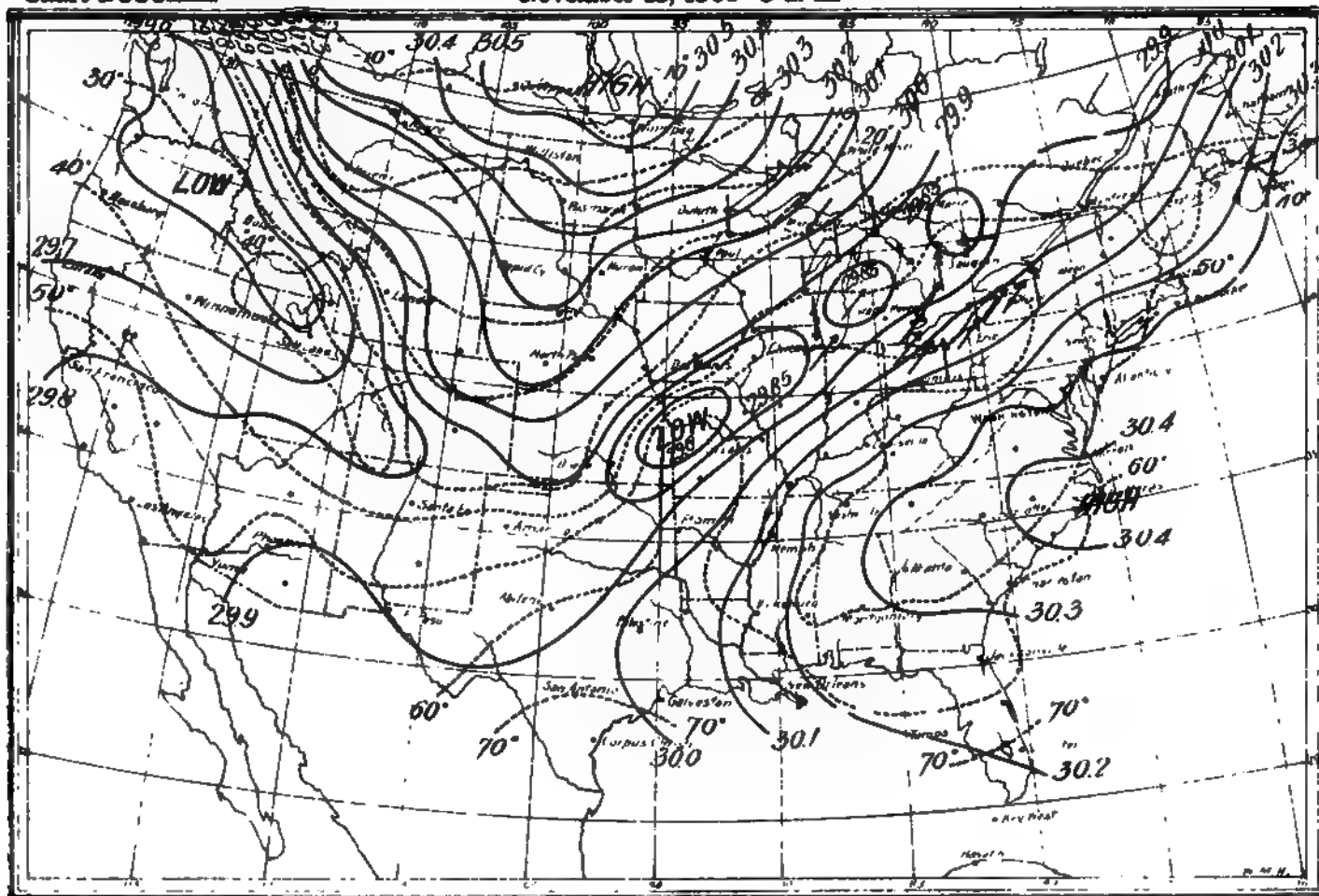


Chart DCOOXXII

November 18, 1900—8 p. m.



Chart D000XIII.

November 19, 1900—8 a. m.

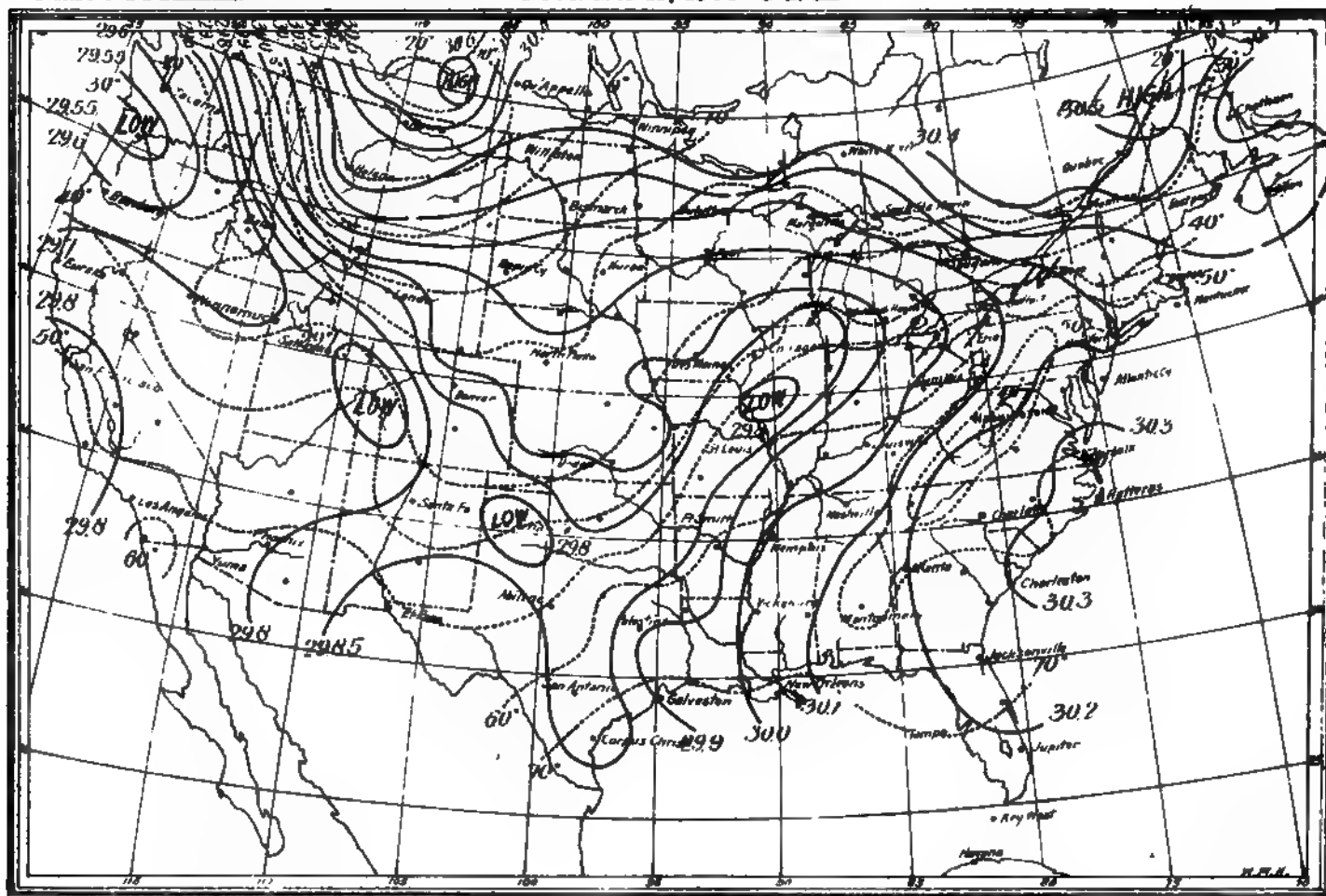


Chart D000XIV.

November 19, 1900—8 p. m..

Chart D000XXV.

November 20, 1900—8 a. m.

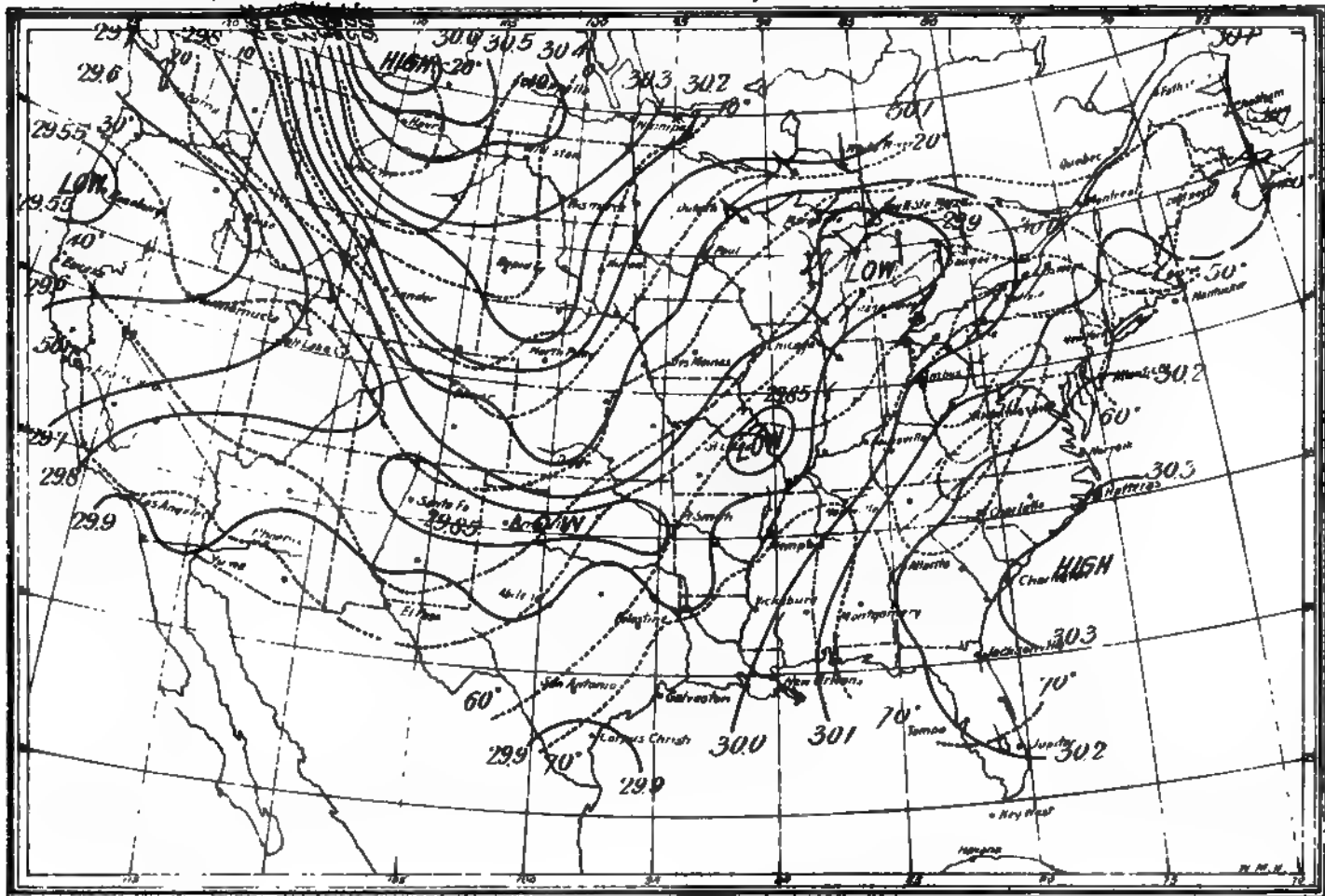


Chart D000XXVI.

November 20, 1900—8 p. m.

Chart DCCOXXVII.

November 21, 1900—8 a. m.

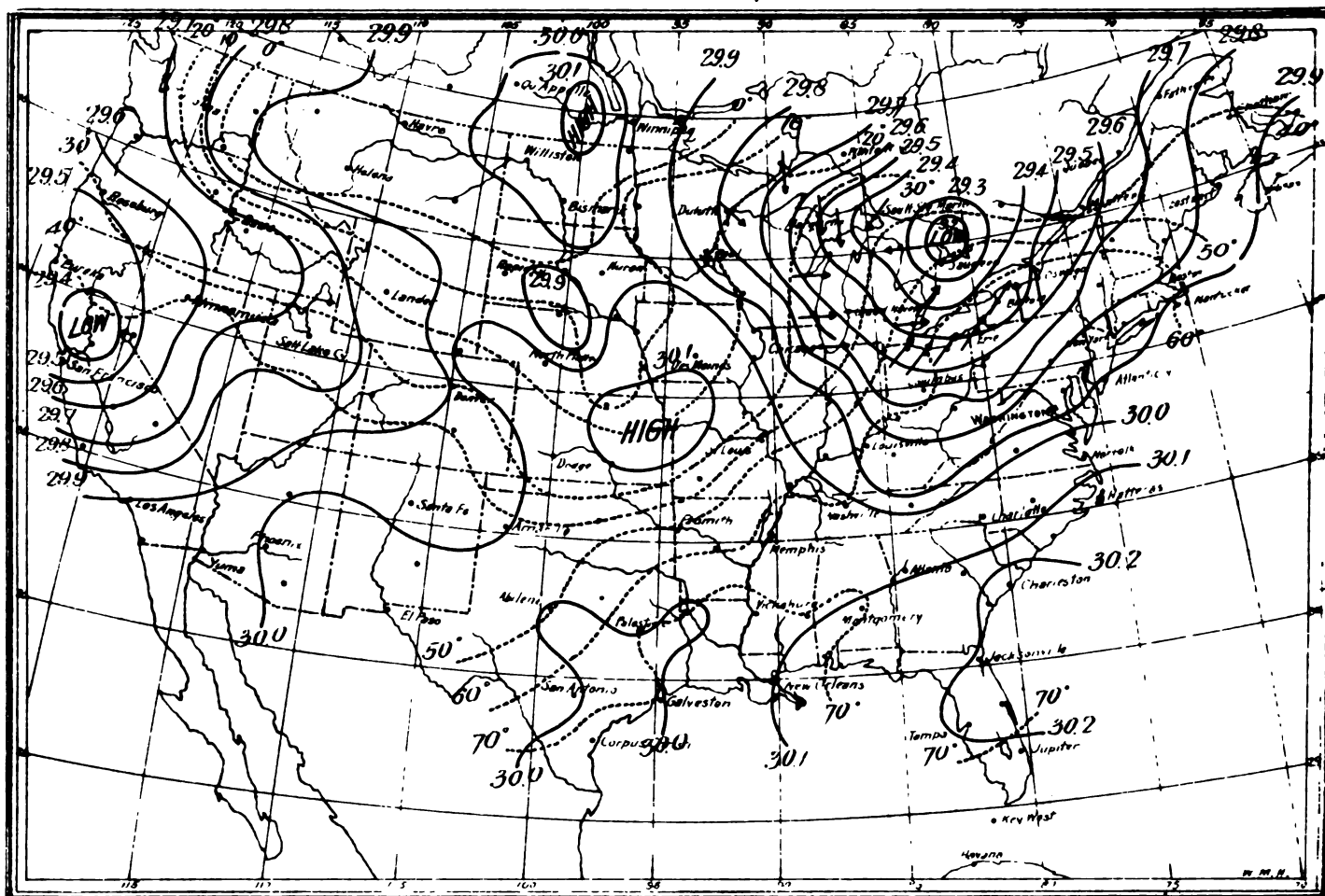


Chart DCCOXXVIII.

November 21, 1900—8 p. m.

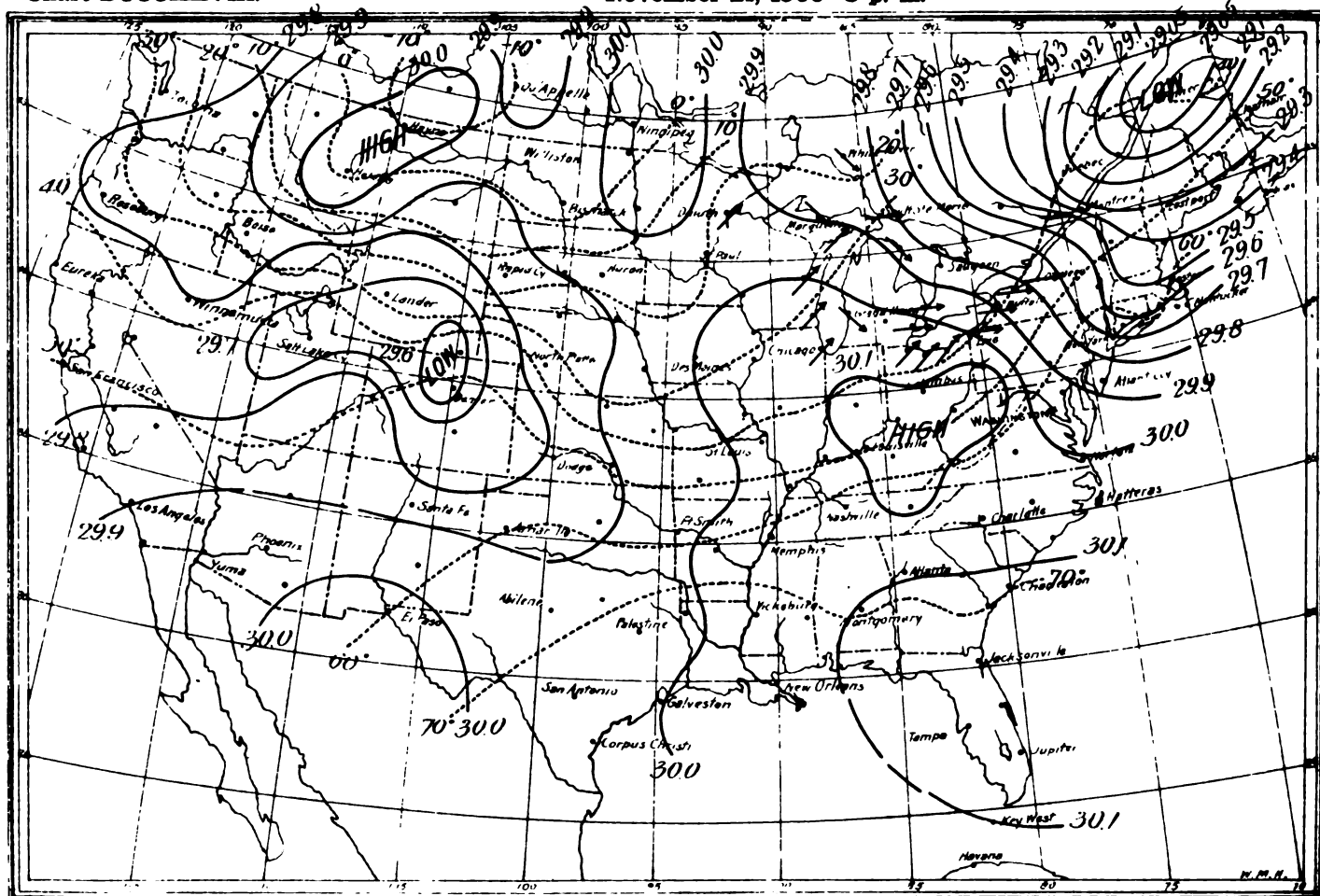


Chart DCCOXXIX.

December 7, 1876—4:35 p. m.

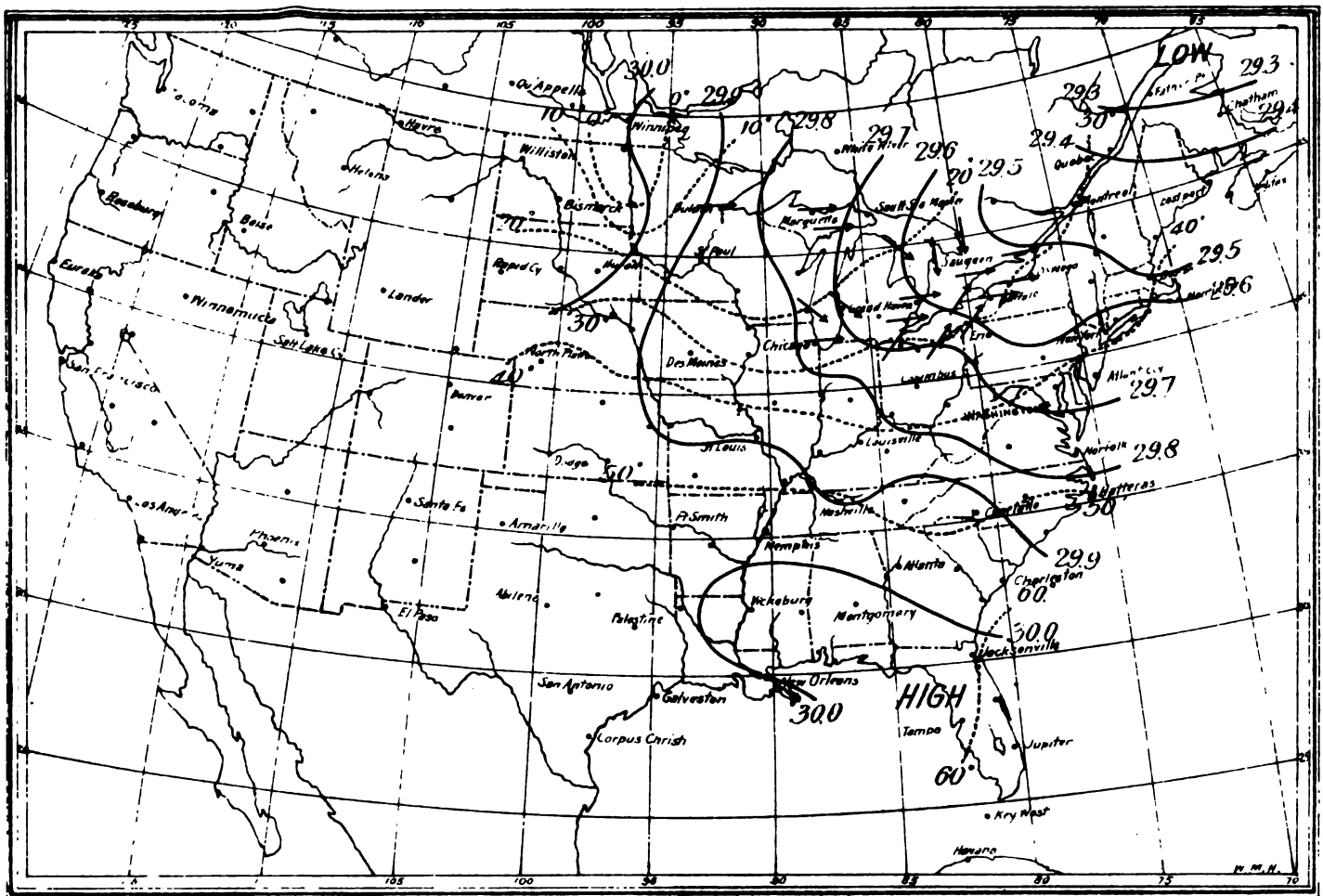
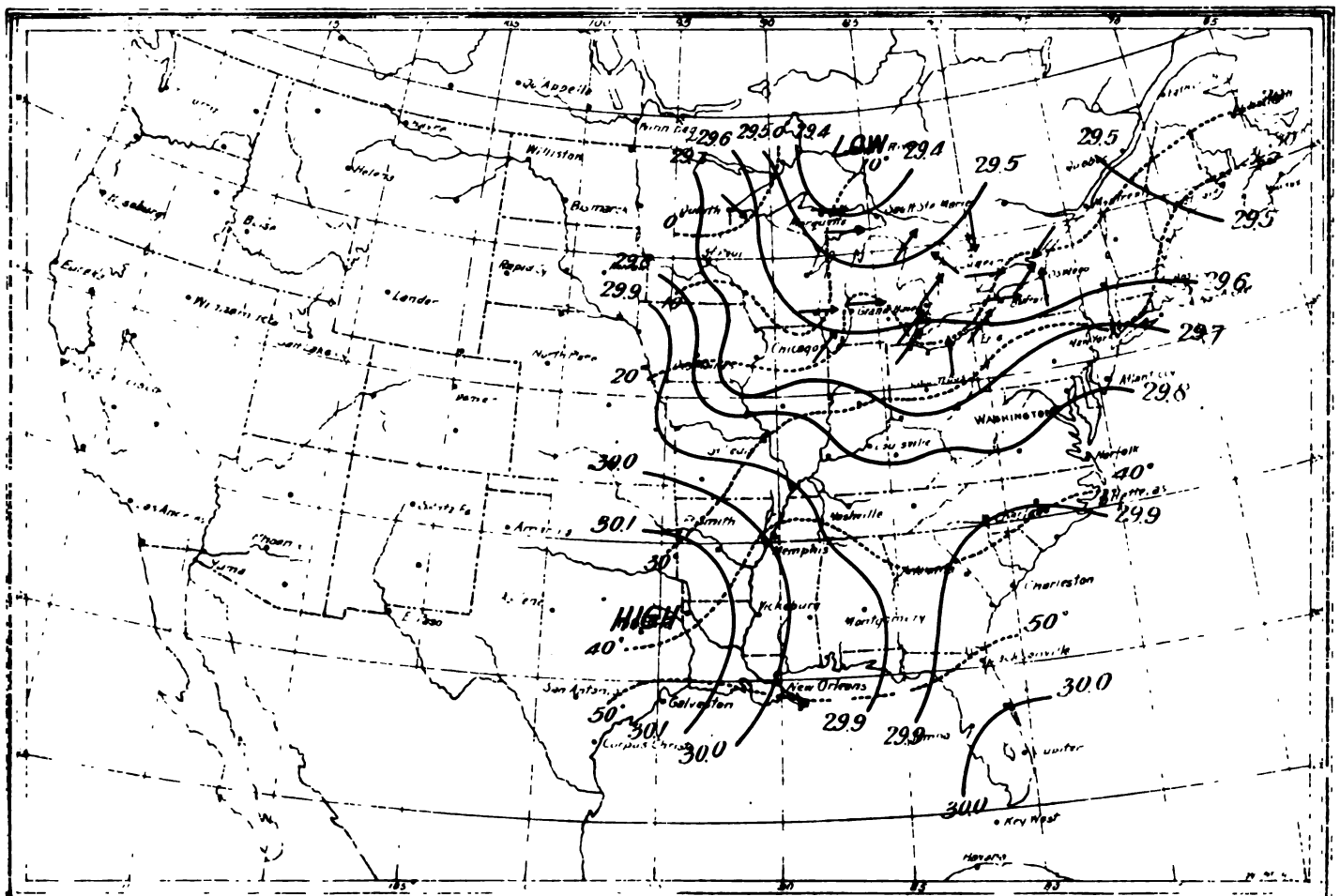


Chart DCCOXXX.

December 8, 1876—7:35 a. m.



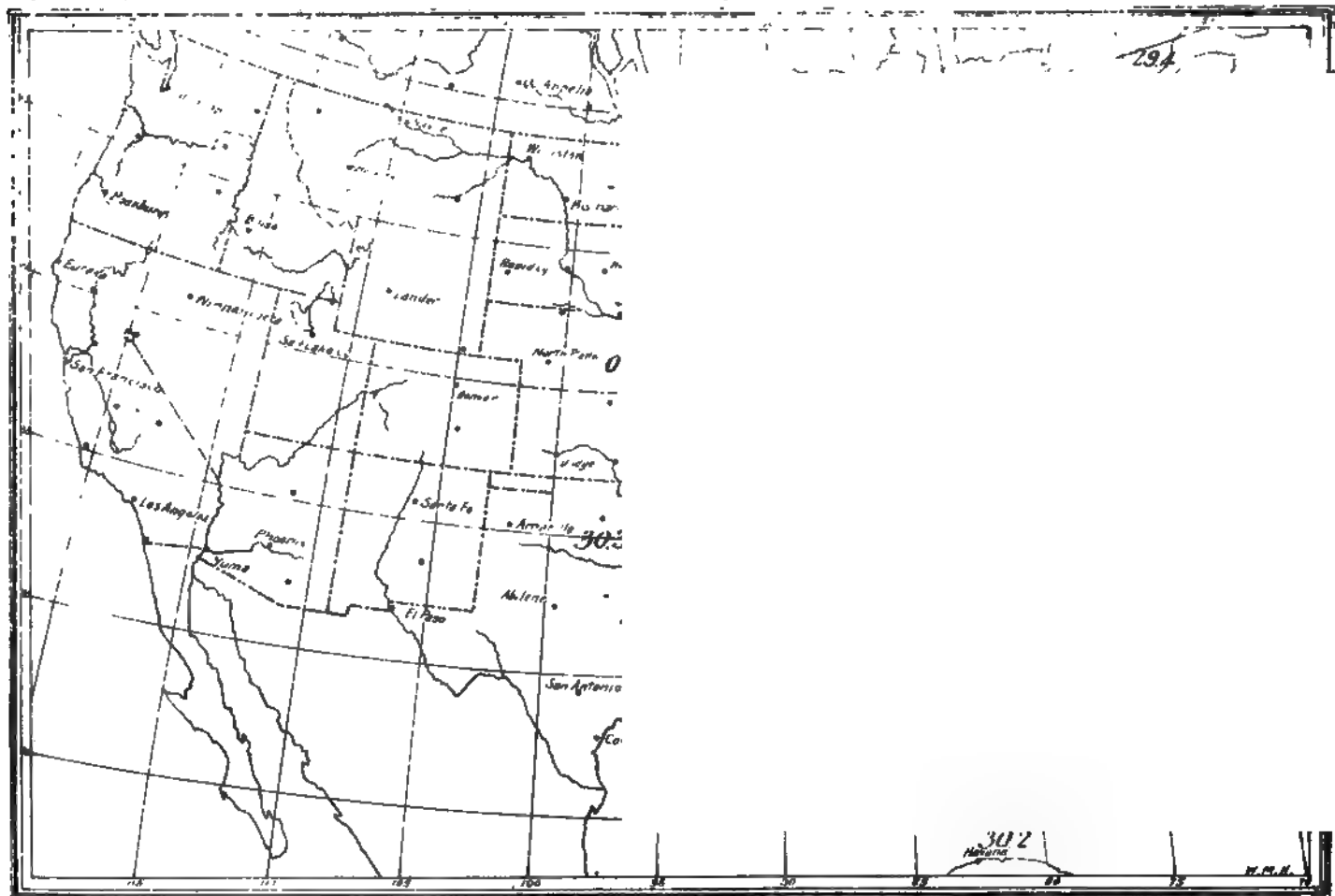
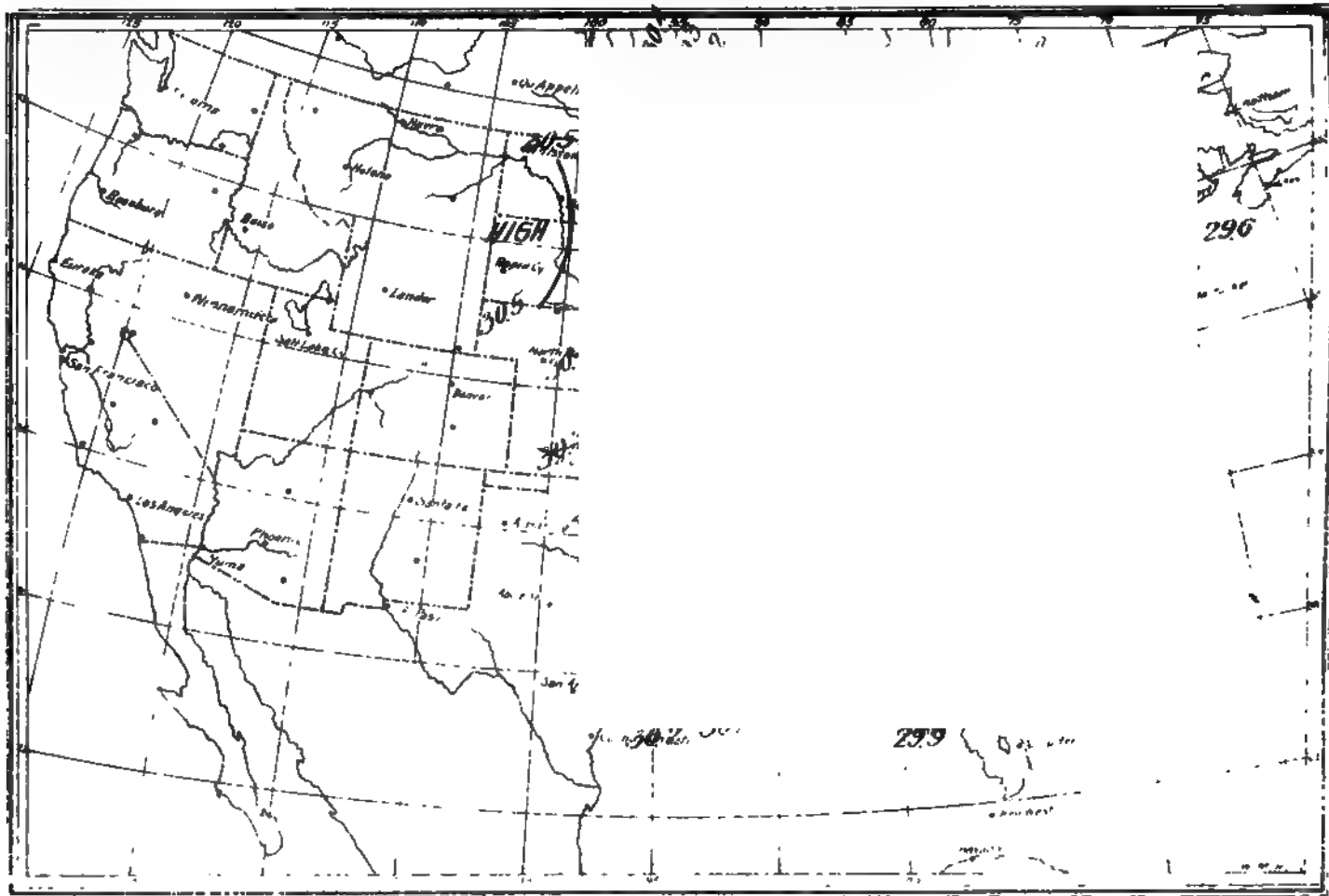


Chart DCCCCXXIII.

December 28, 1876—7:35 a. m.

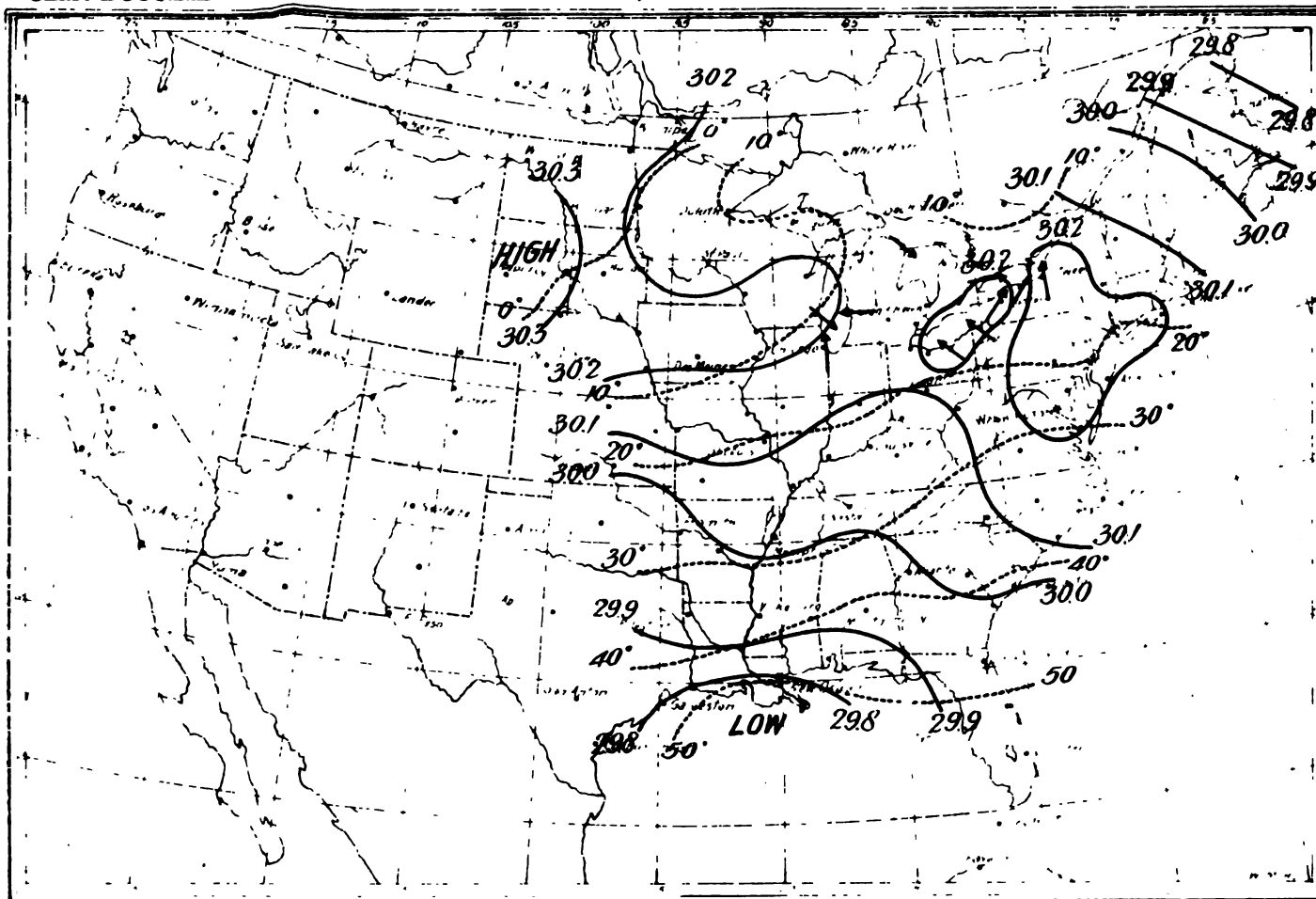


Chart DCCCCXXIV.

December 28, 1876—4:35 p. m.

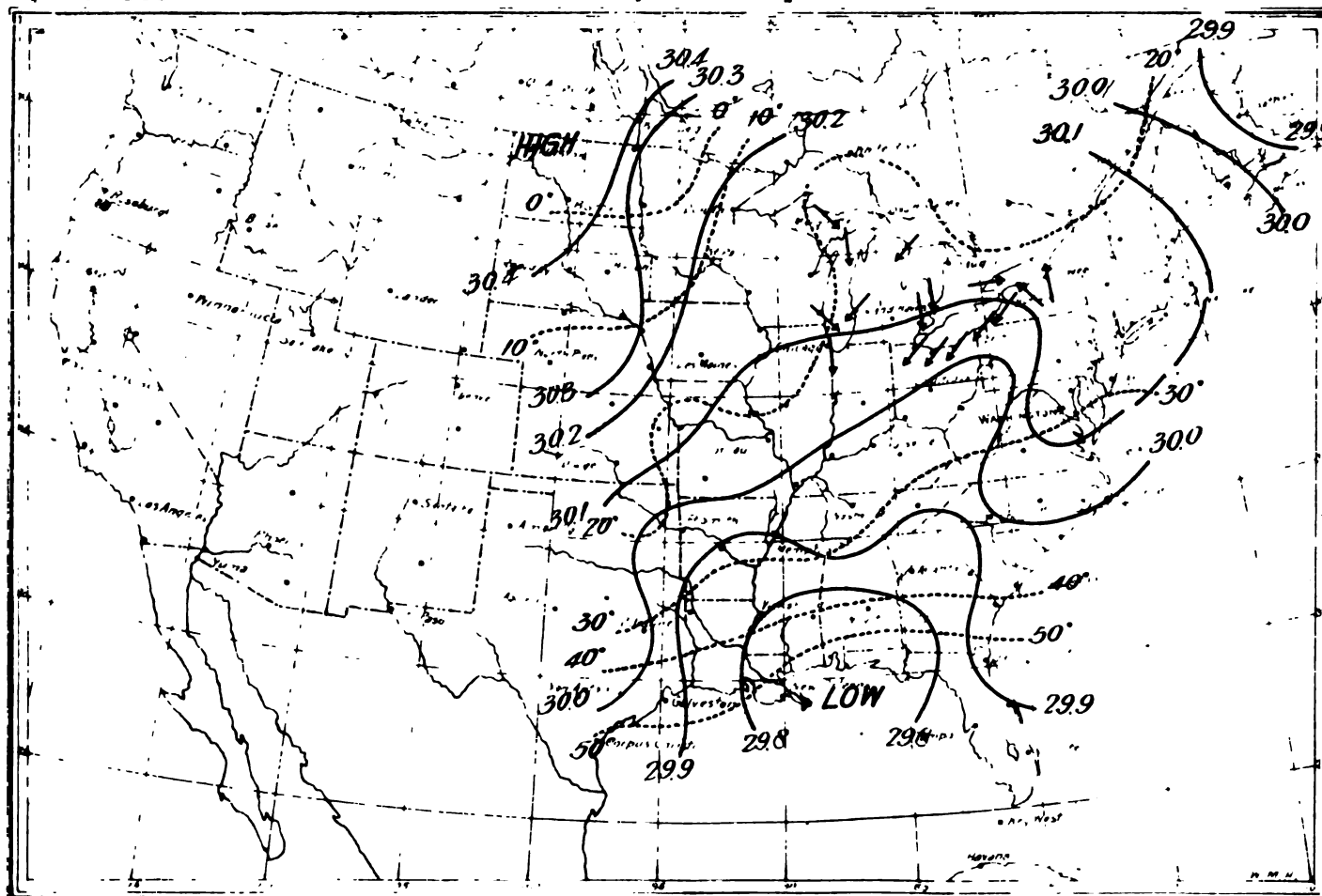


Chart DCCCCXXV.

December 29, 1876—7:35 a. m.

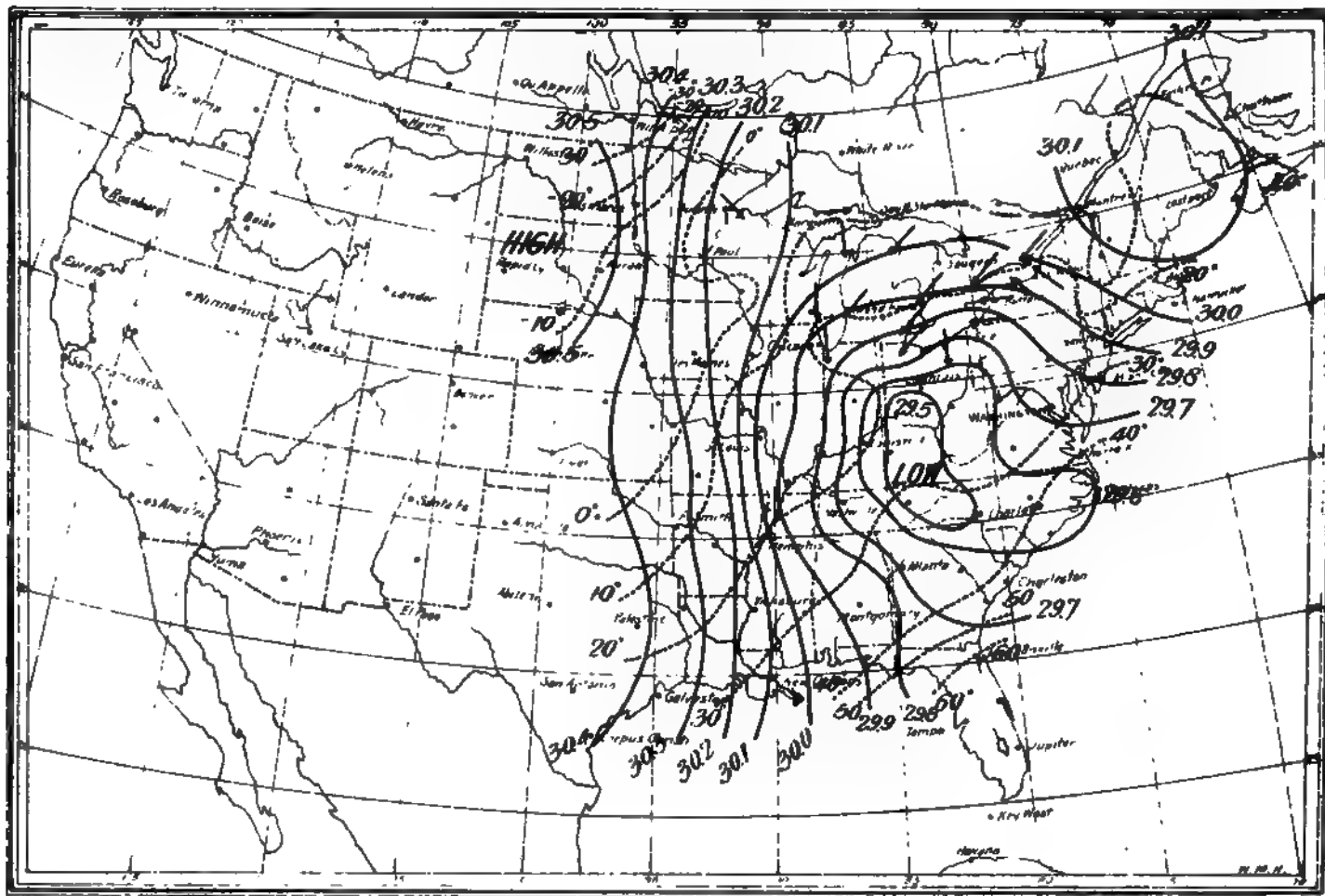


Chart DCCCCXXVI.

December 29, 1876—4:35 p. m.

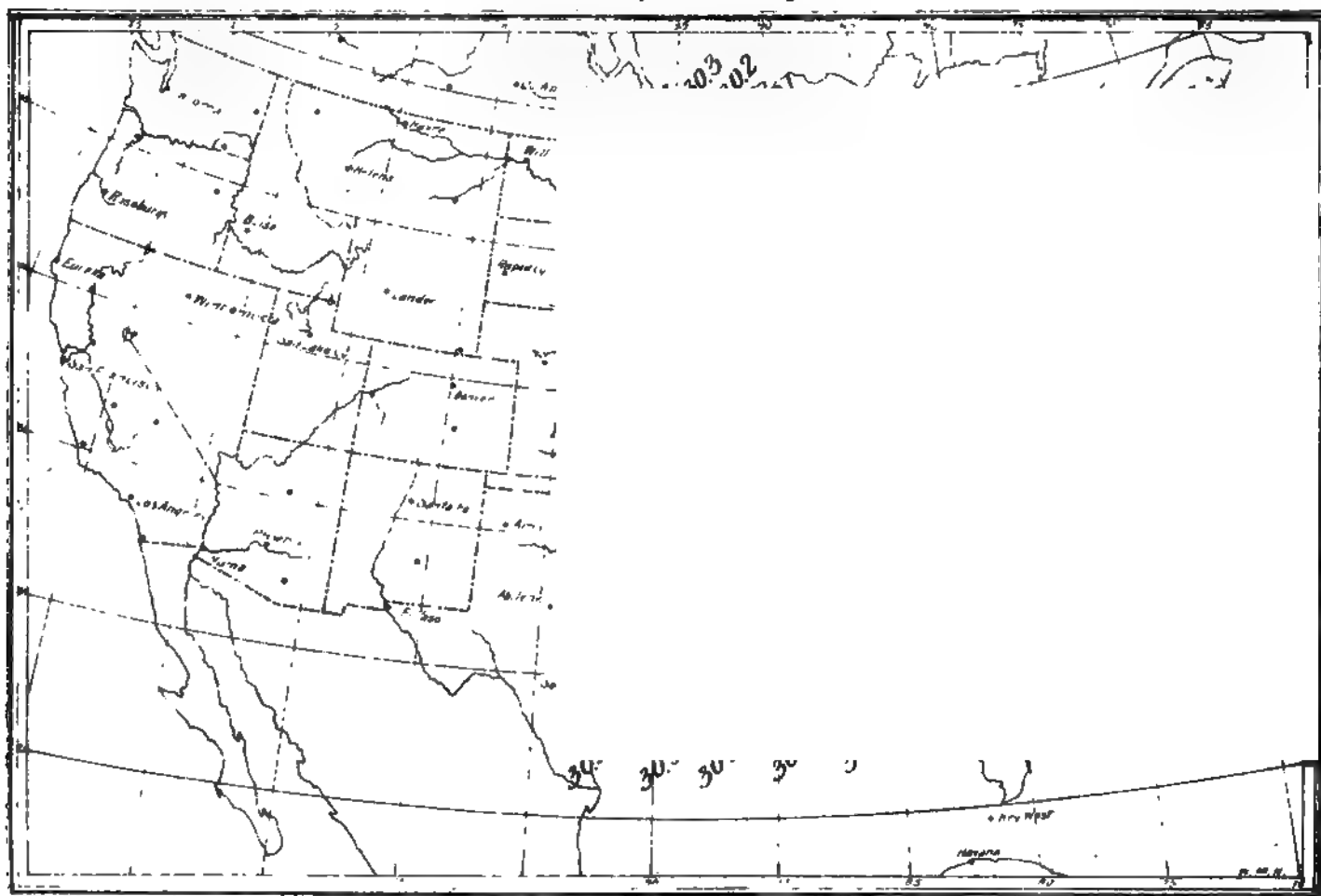


Chart D000XXXVII.

December 4, 1877—7:35 a. m.

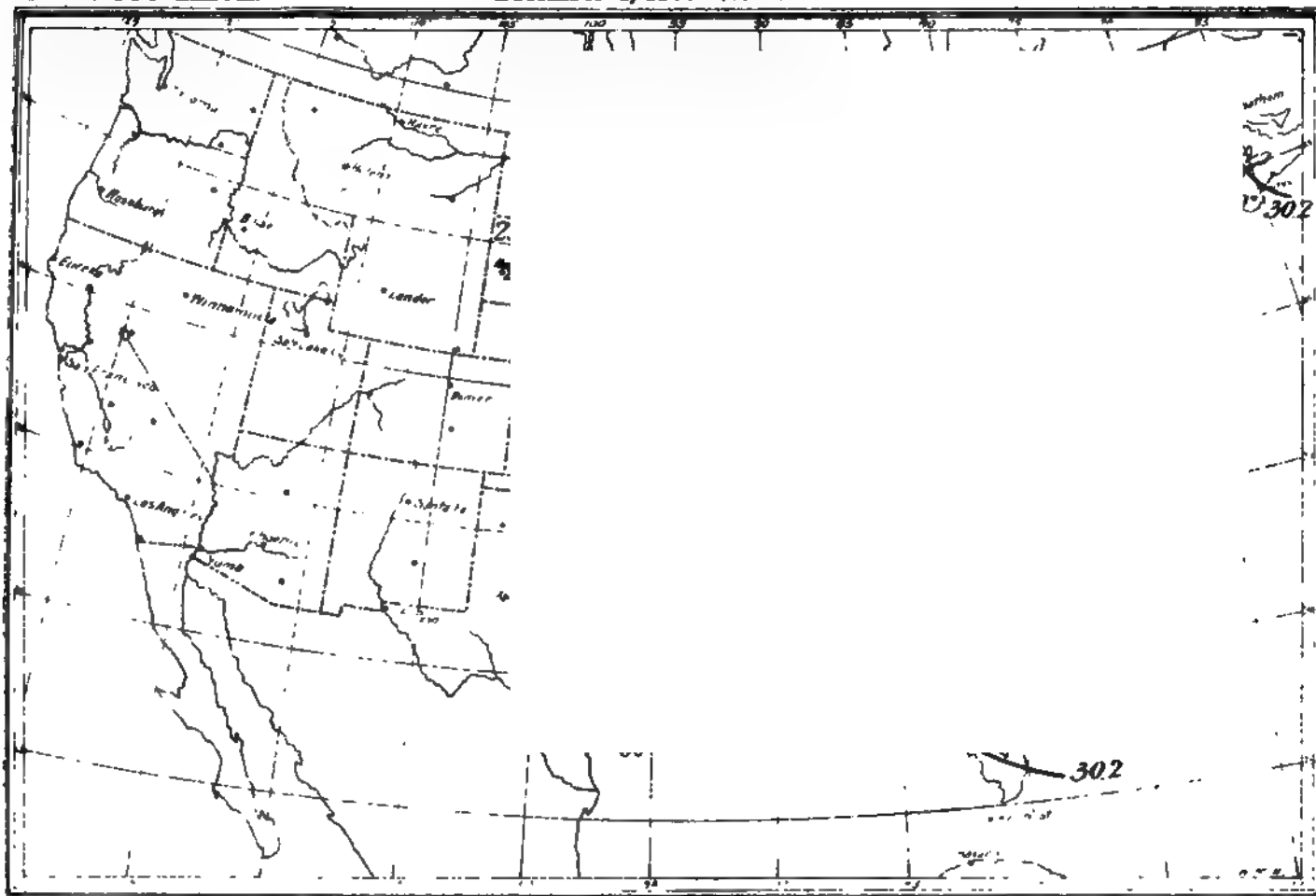


Chart D000XXXVIII.

December 4, 1877—4:35 p. m.

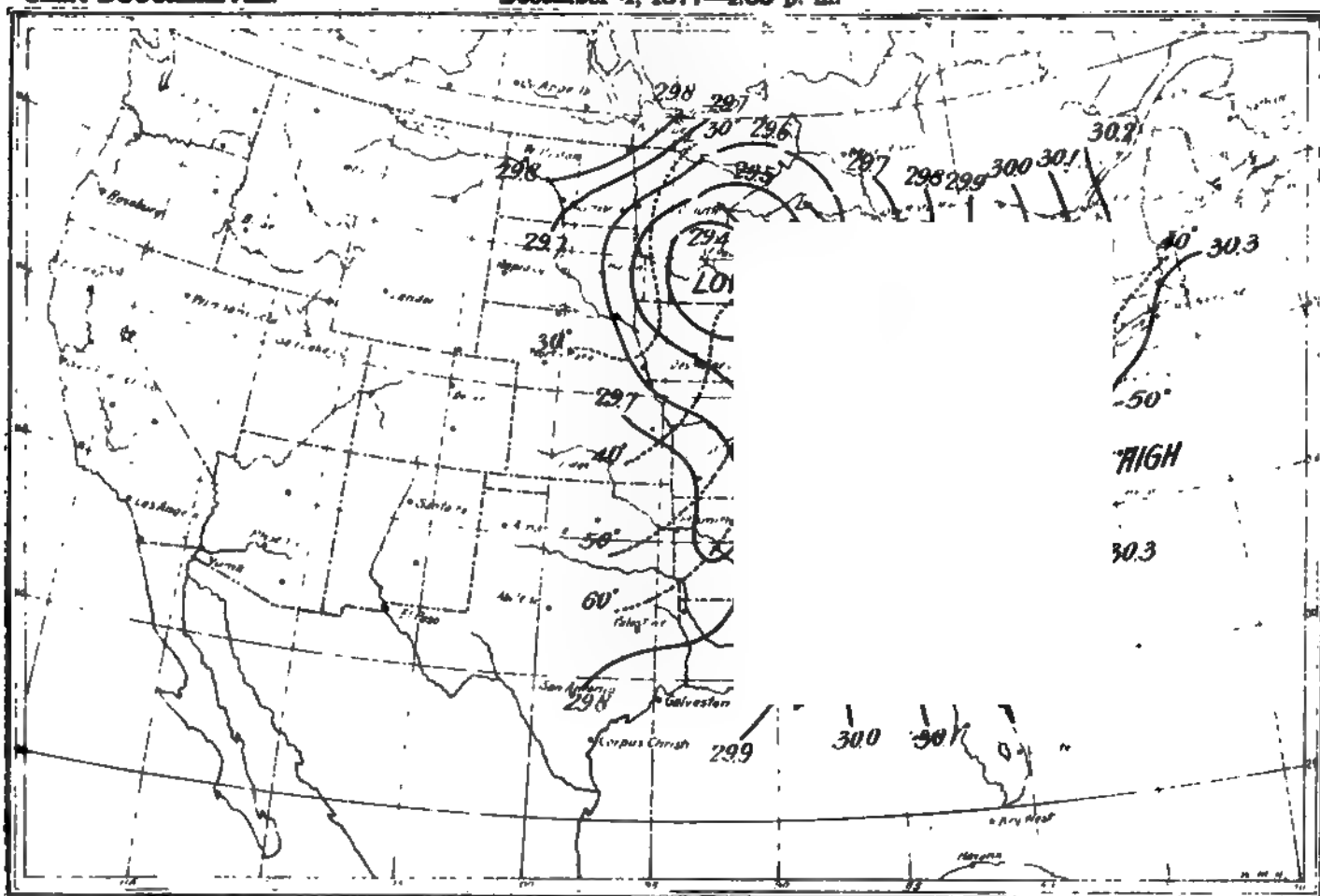


Chart D000XXXIX.

December 5, 1877—7:35 a. m.

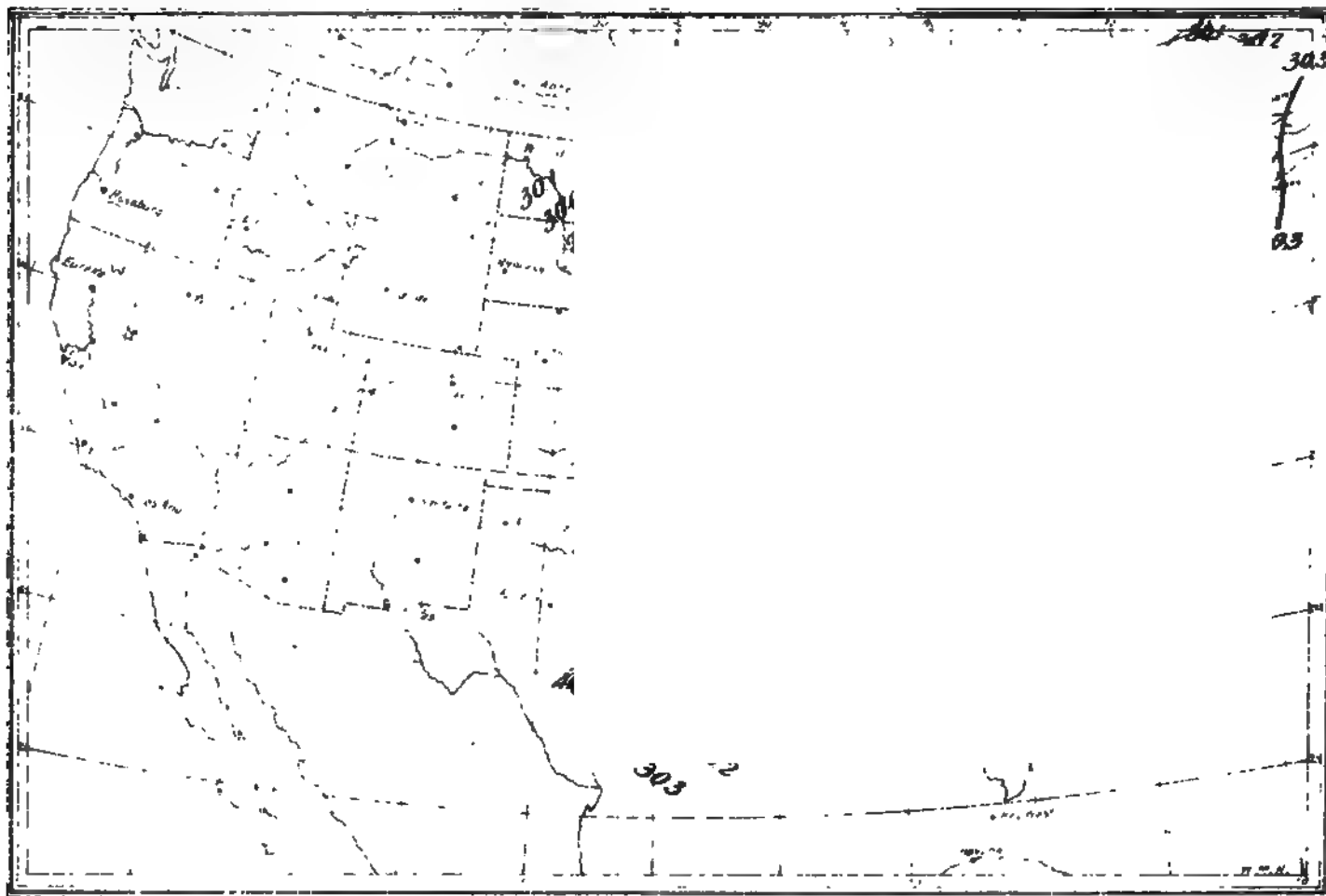


Chart D000XLI.

December 5, 1877—4:35 p. m.

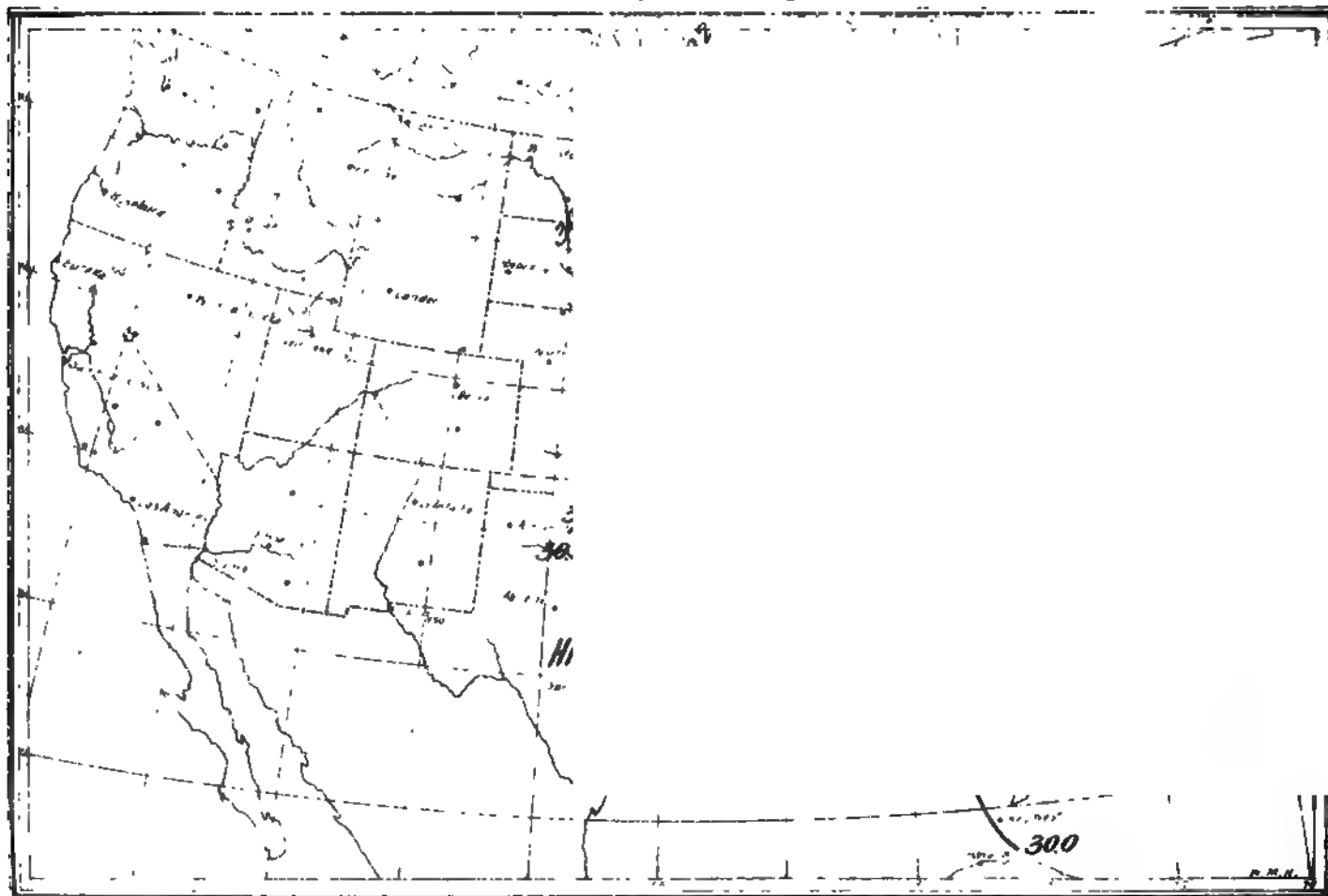


Chart D000XLI

December 9, 1878—7:35 a. m.

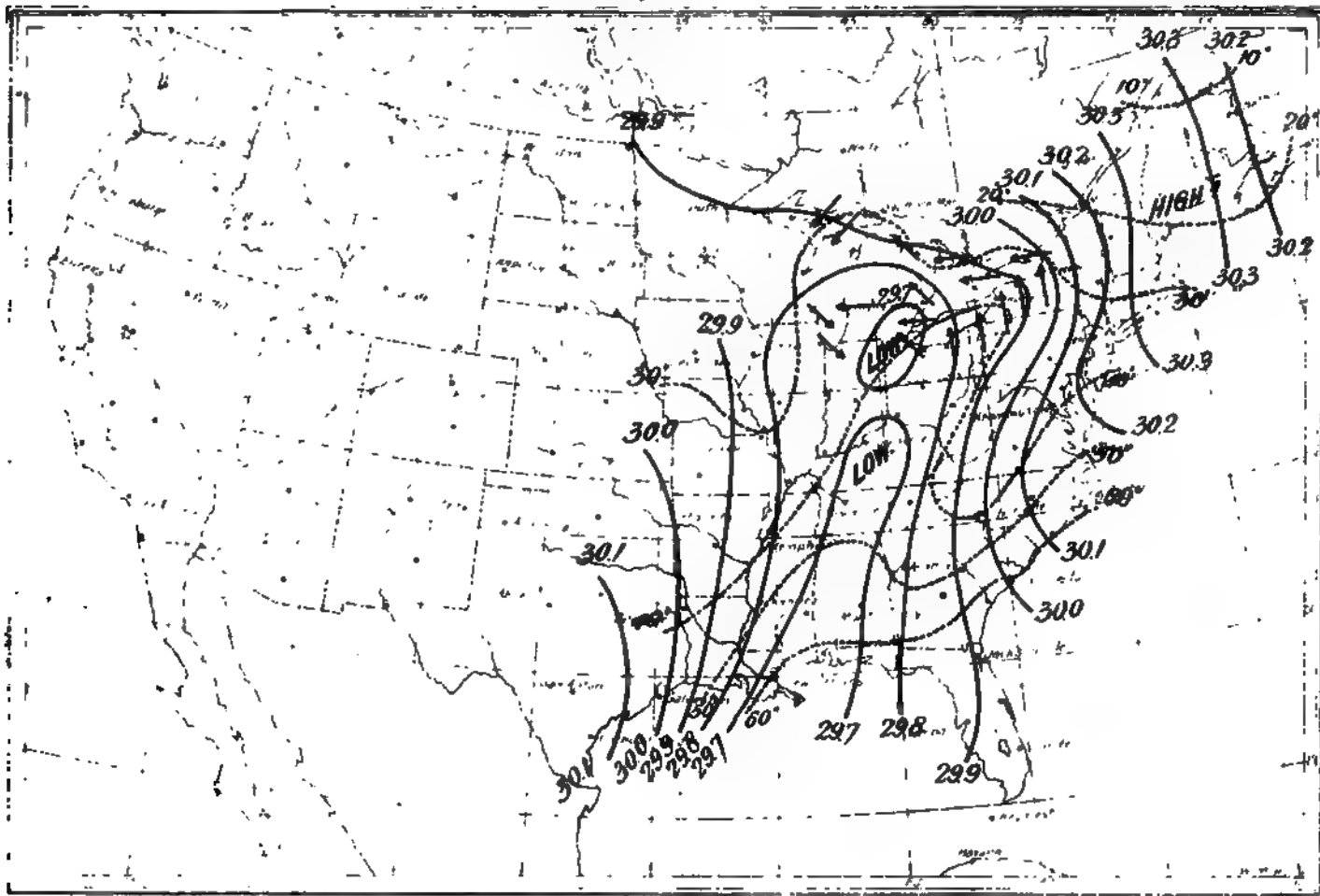


Chart D000XLI

December 9, 1878—4:35 p. m.



Chart DCOOXLIII.

December 10, 1878—7:35 a. m.

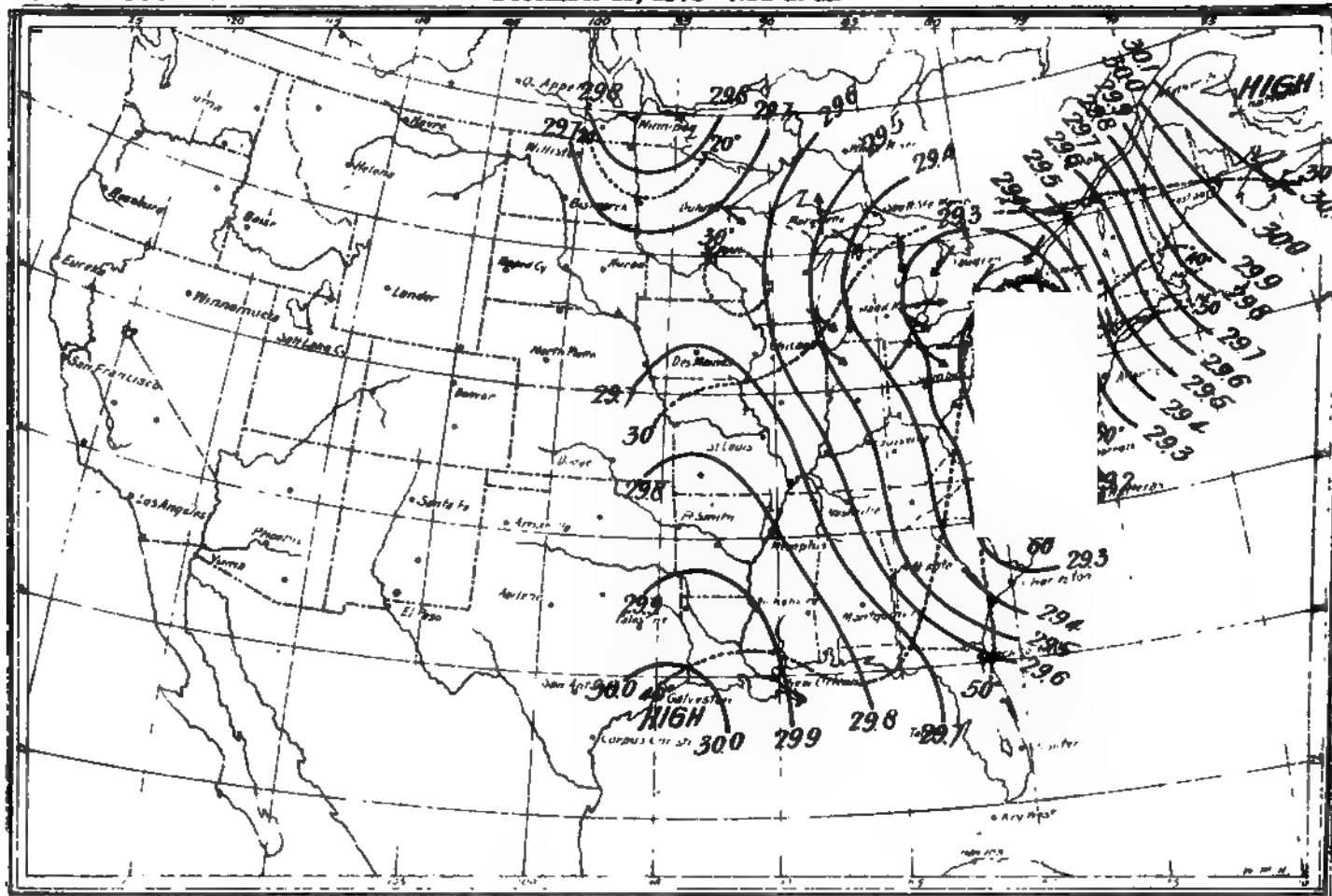


Chart DCOOXLIV.

December 10, 1878—4:35 p. m.

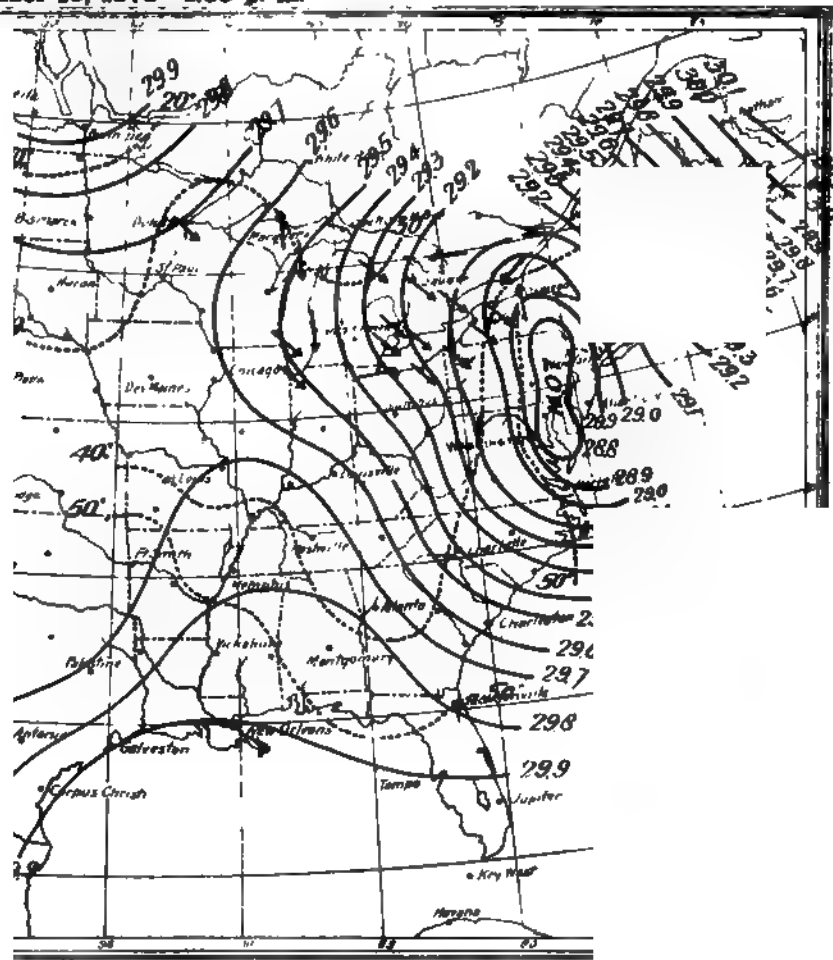


Chart DCCCXLV.

December 20, 1878—7:35 a. m.

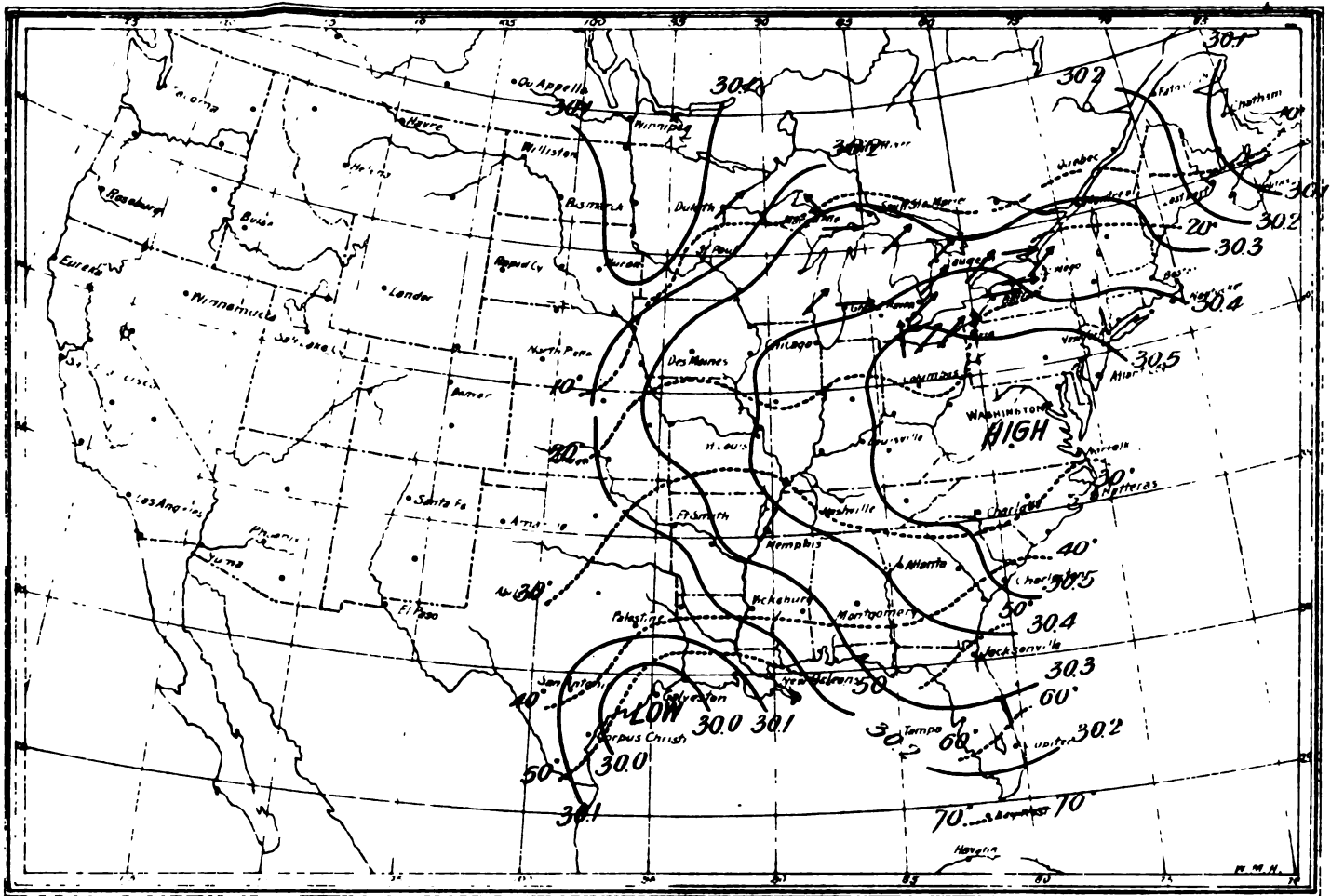


Chart DCCCXLVI.

December 20, 1878—4:35 p. m.

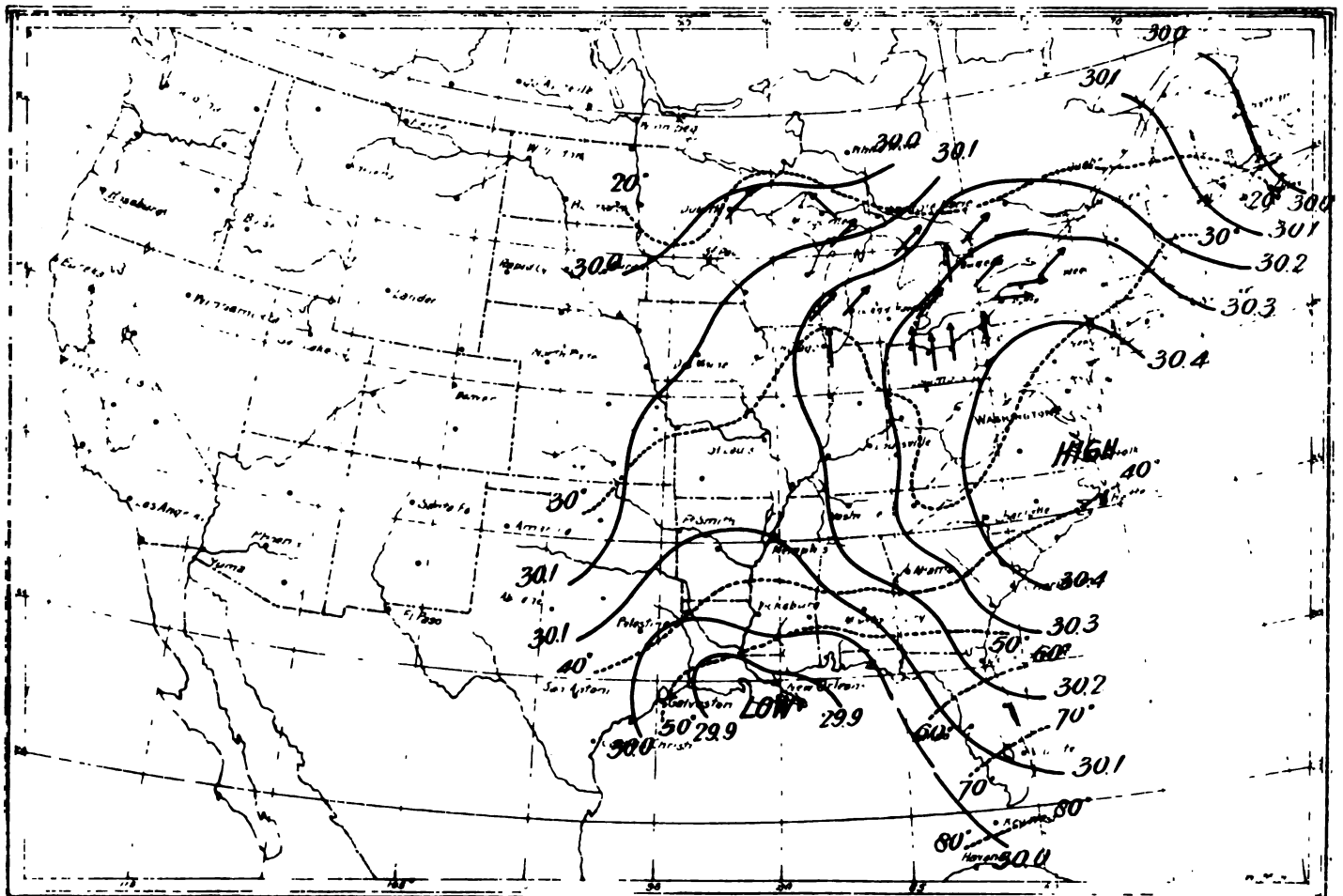


Chart DCOOXLVII.

December 21, 1878—7:35 a. m.

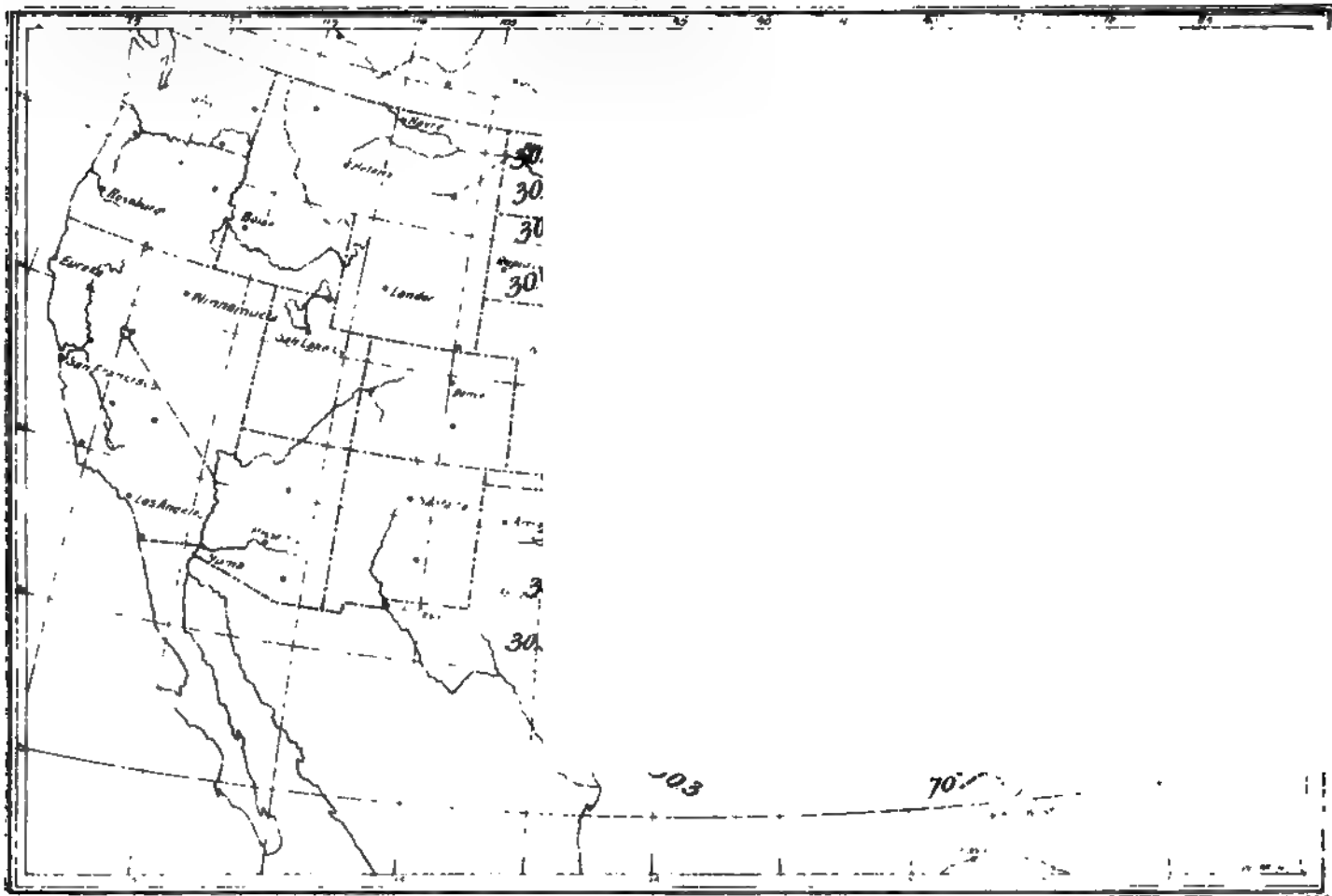


Chart DCOOXLVIII.

December 21, 1878—4:35 p. m.

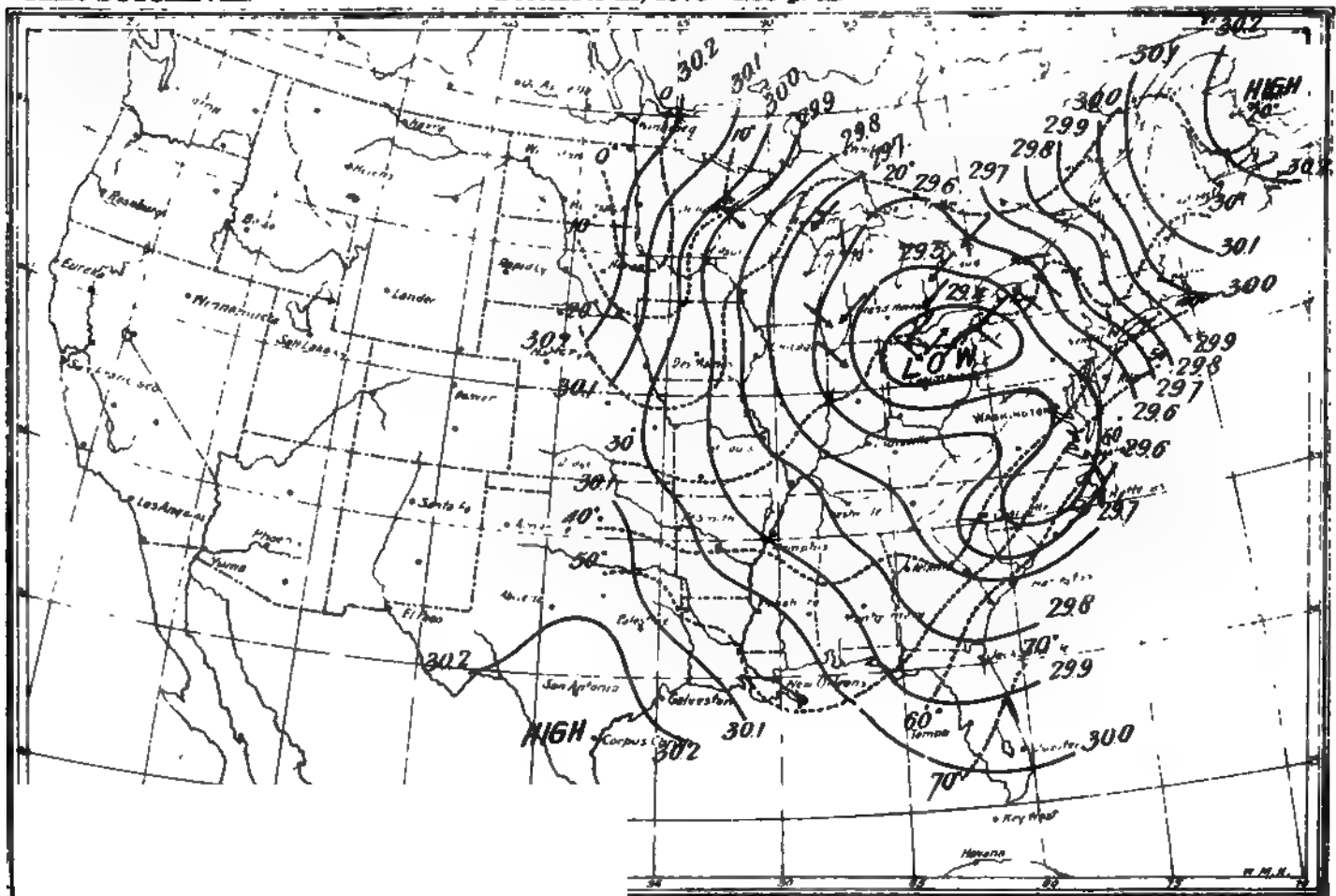


Chart DCOCKLIX.

December 9, 1879—7 a. m.

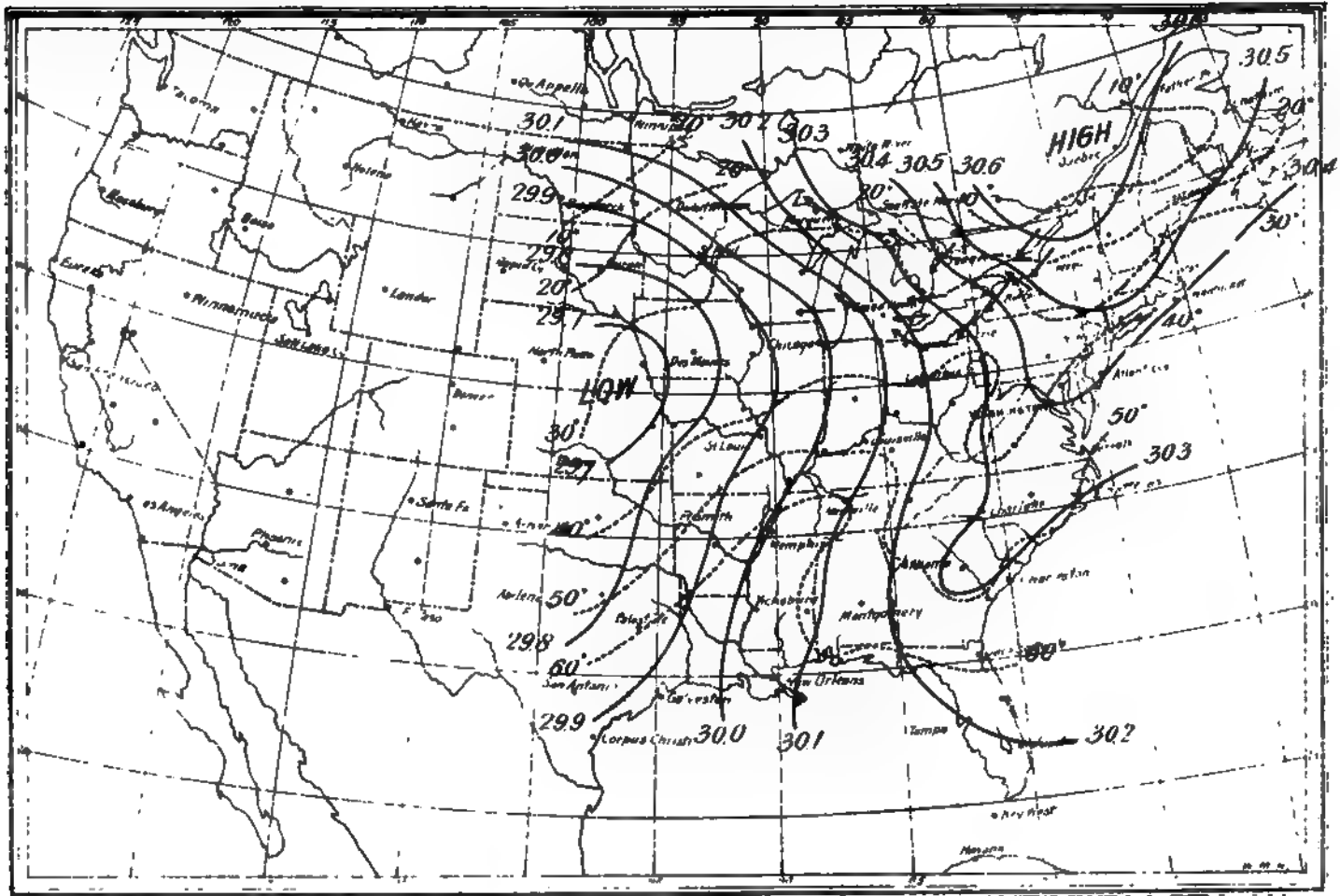


Chart DCOCKL.

December 9, 1879—3 p. m.

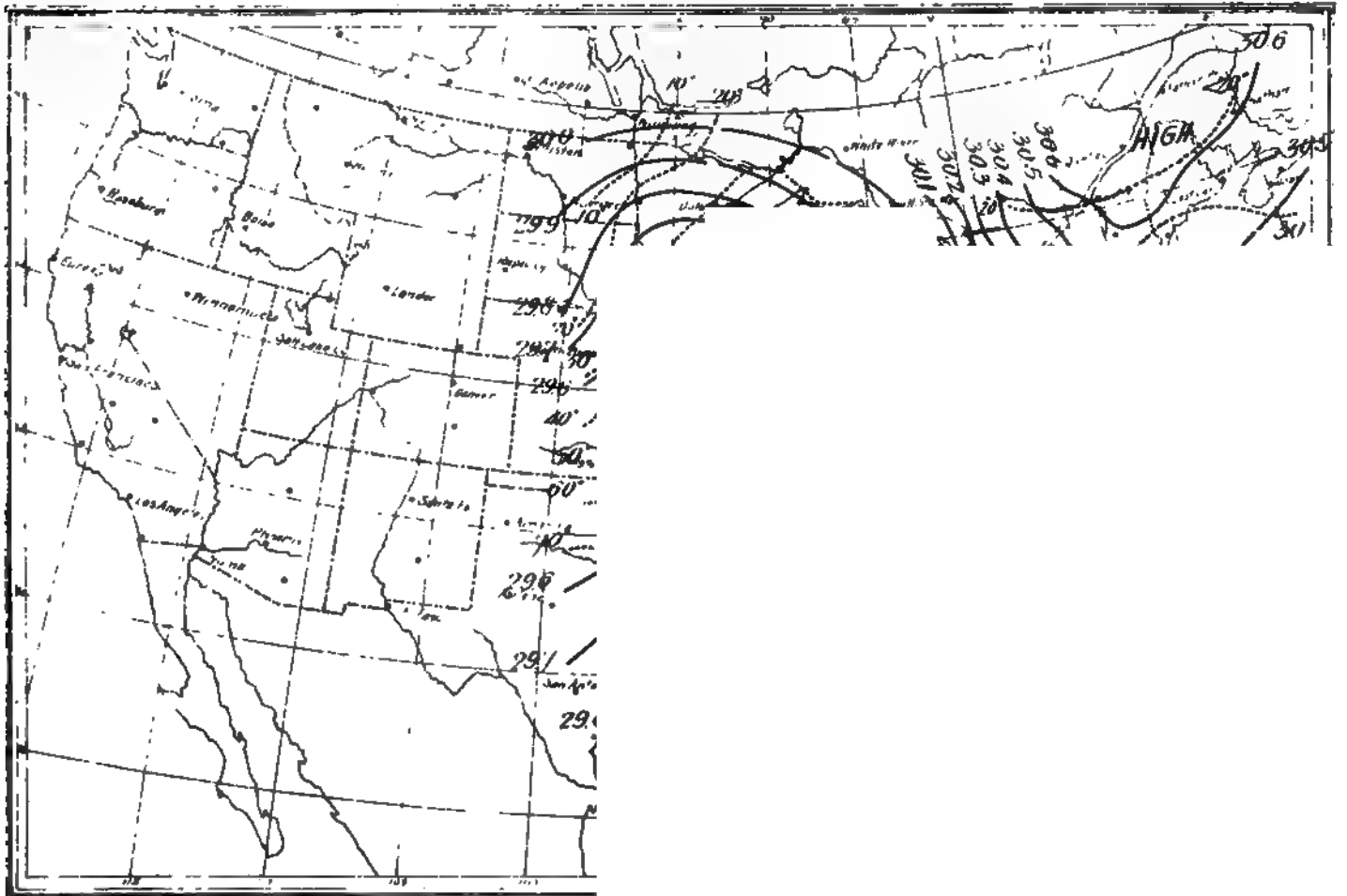


Chart DOOCL

December 10, 1879—7 a. m.

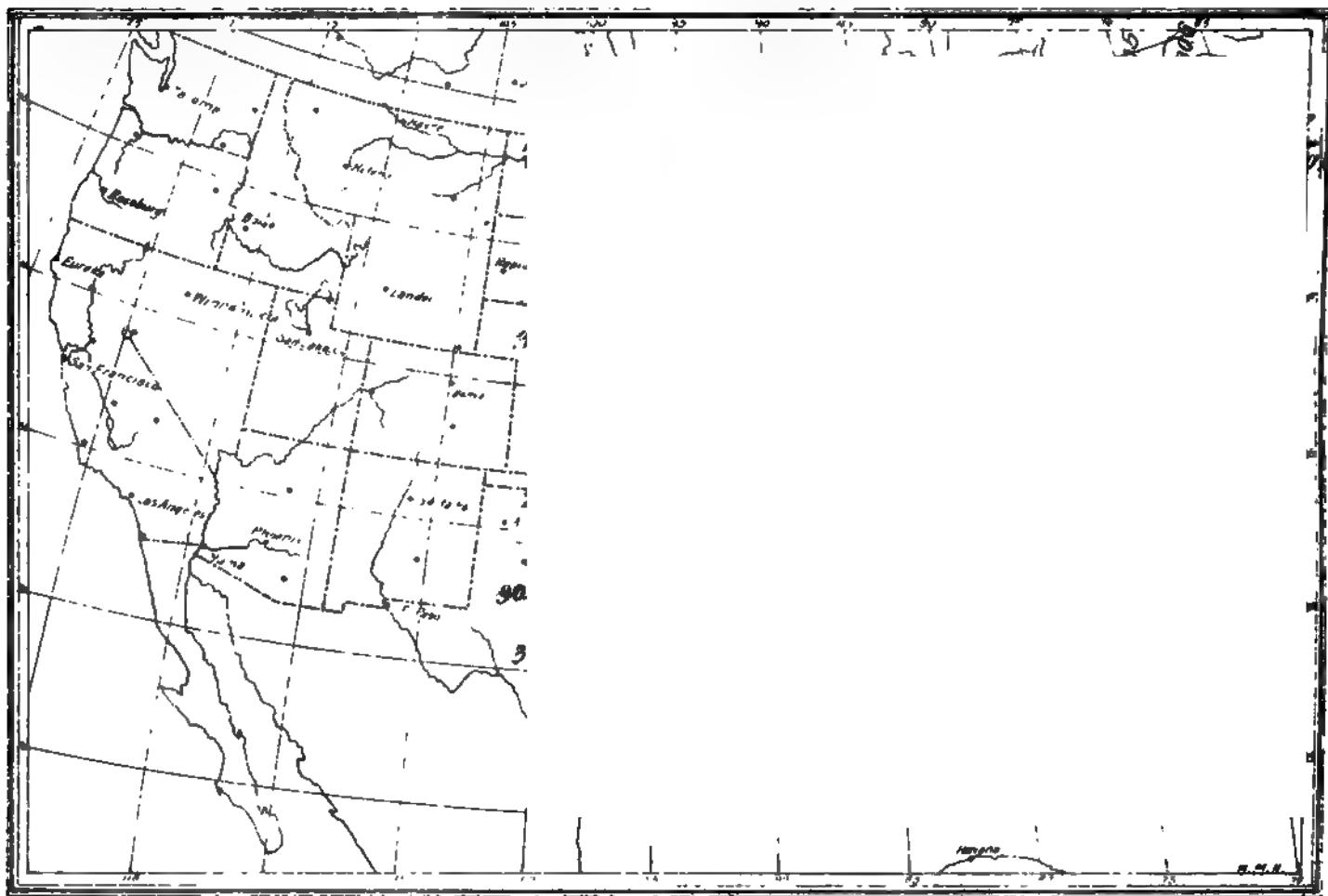


Chart DOOCLII.

December 10, 1879—3 p. m.

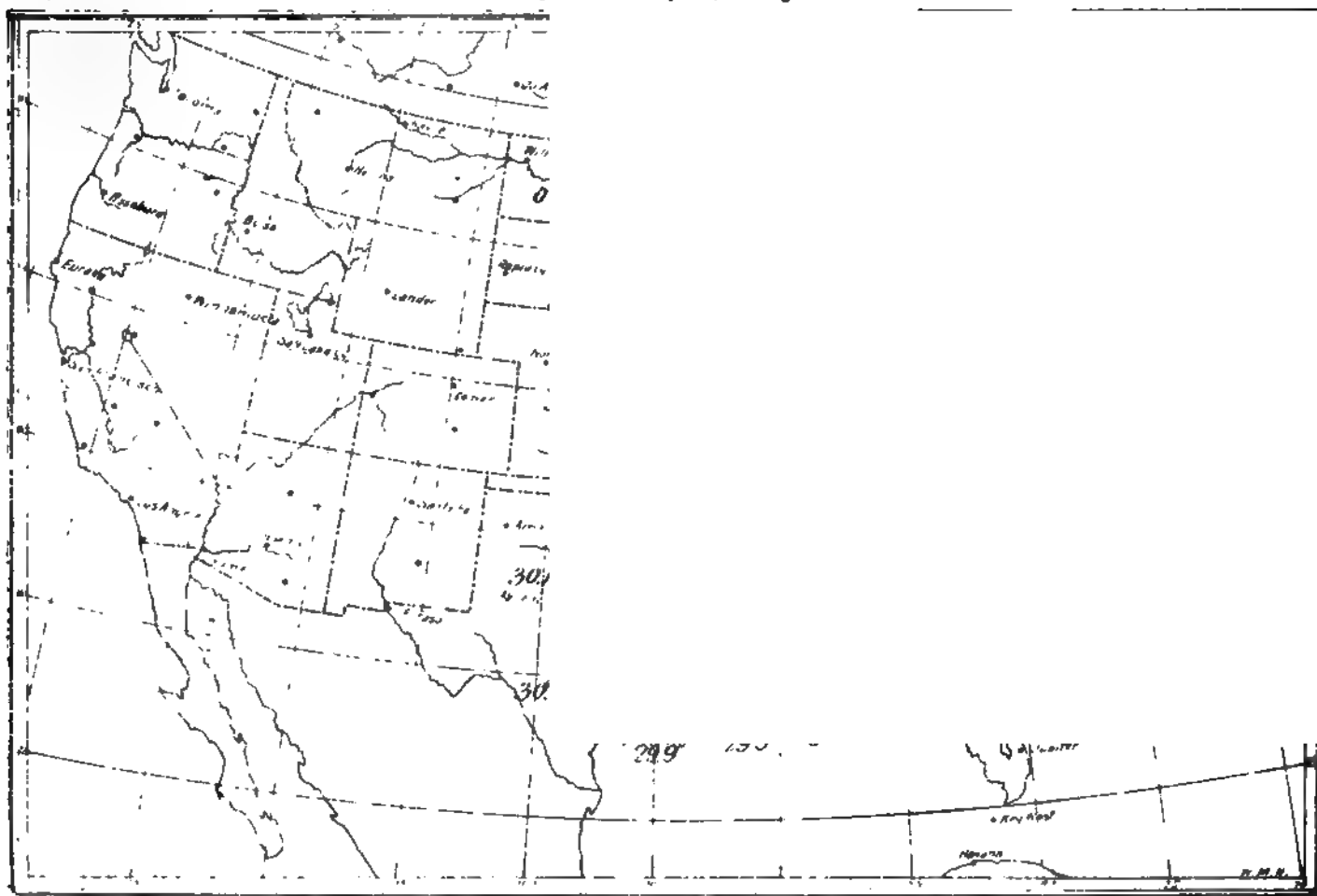


Chart D000LIII.

December 21, 1879—7 a. m.

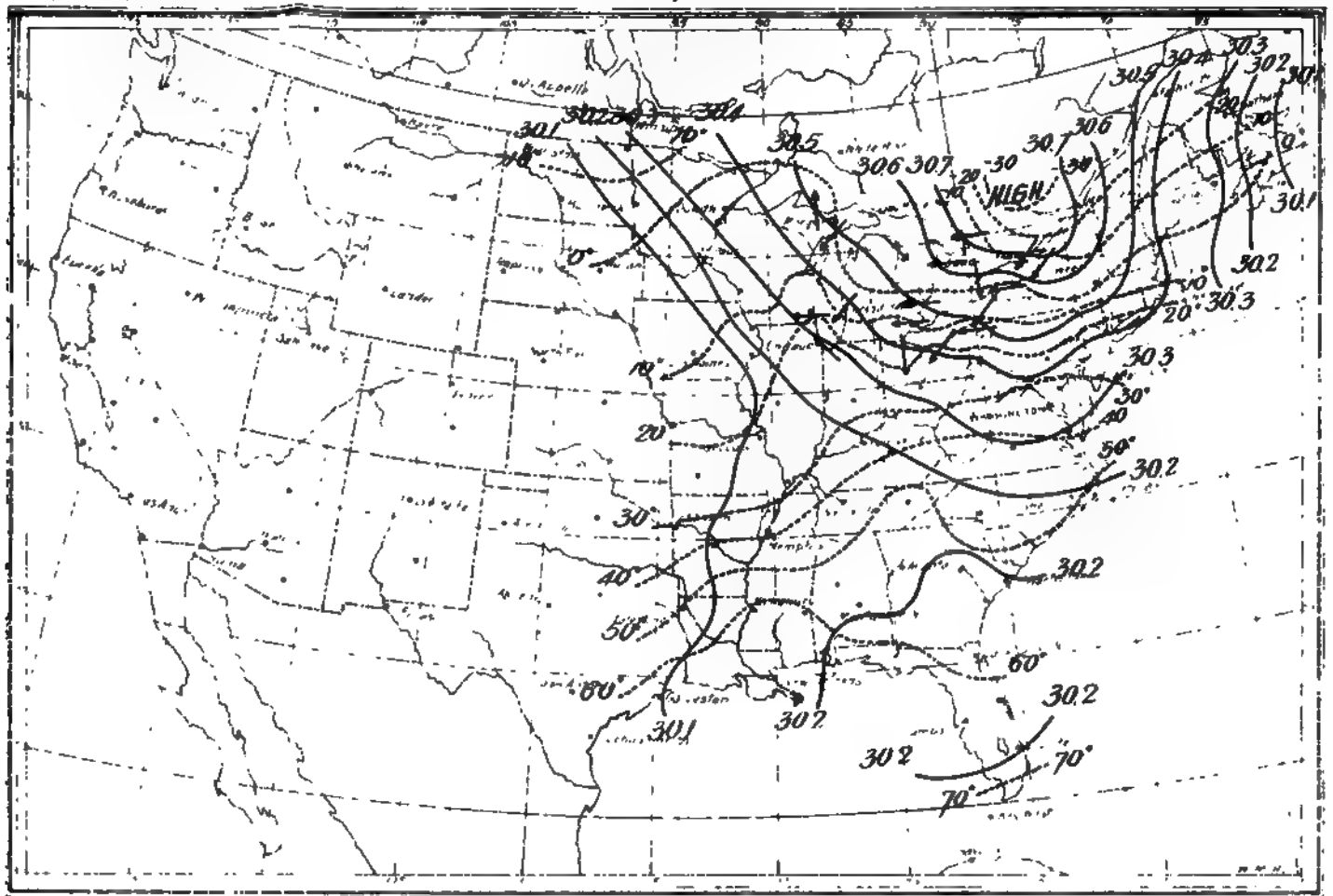


Chart D000LIV.

December 21, 1879—8 p. m.

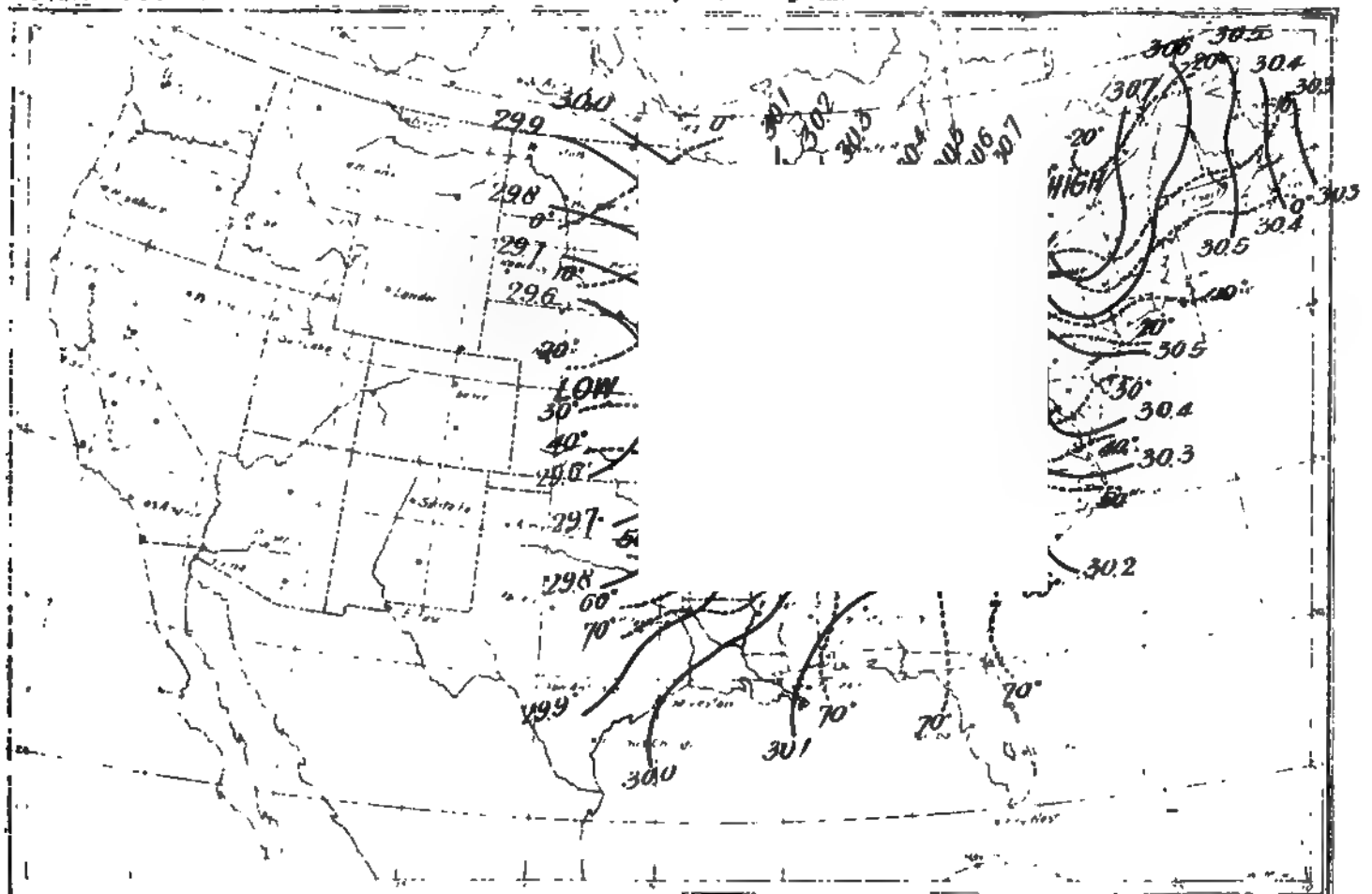


Chart DOOOLV.

December 22, 1879—7 a. m.

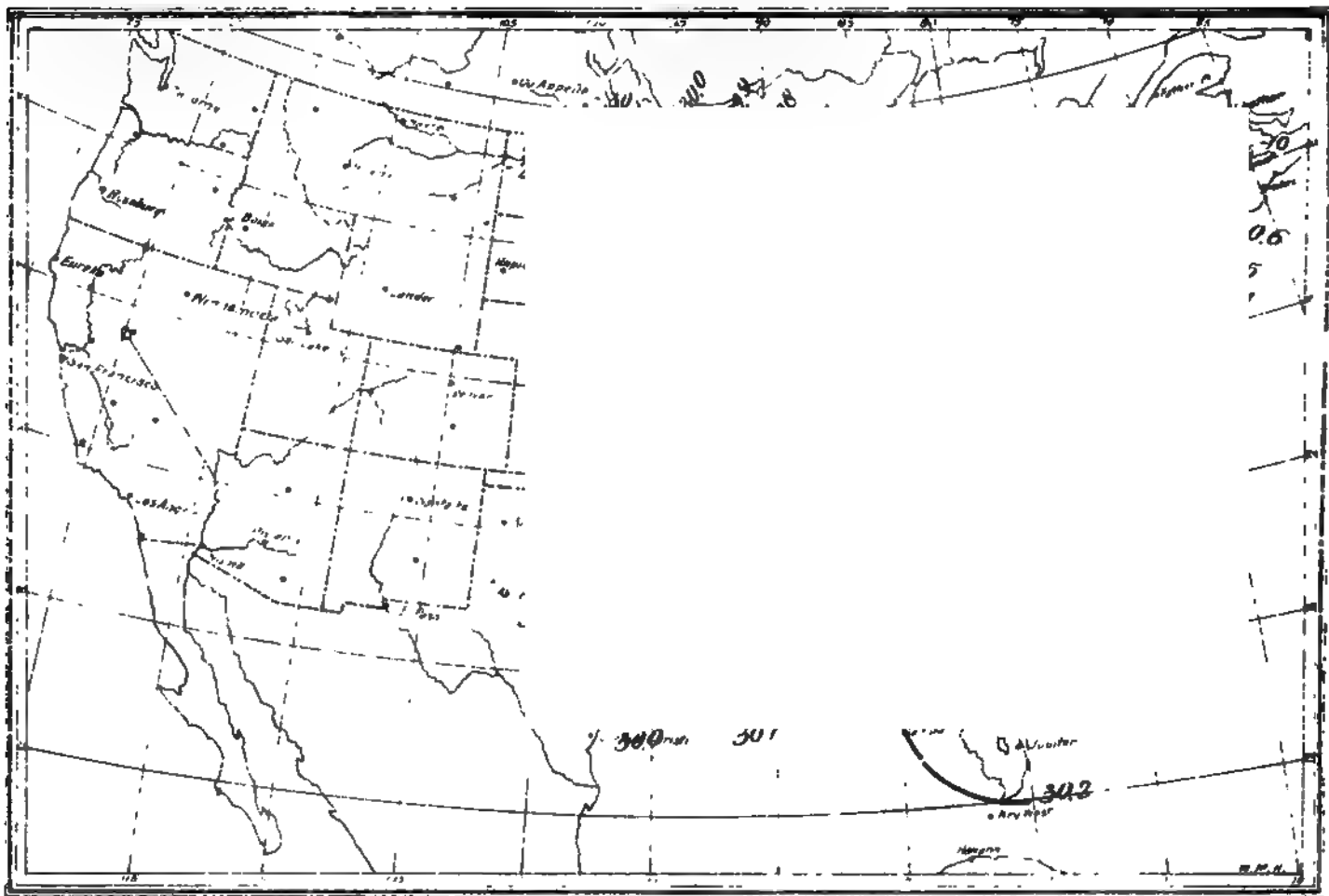


Chart DOOOLVI.

December 22, 1879—3 p. m.

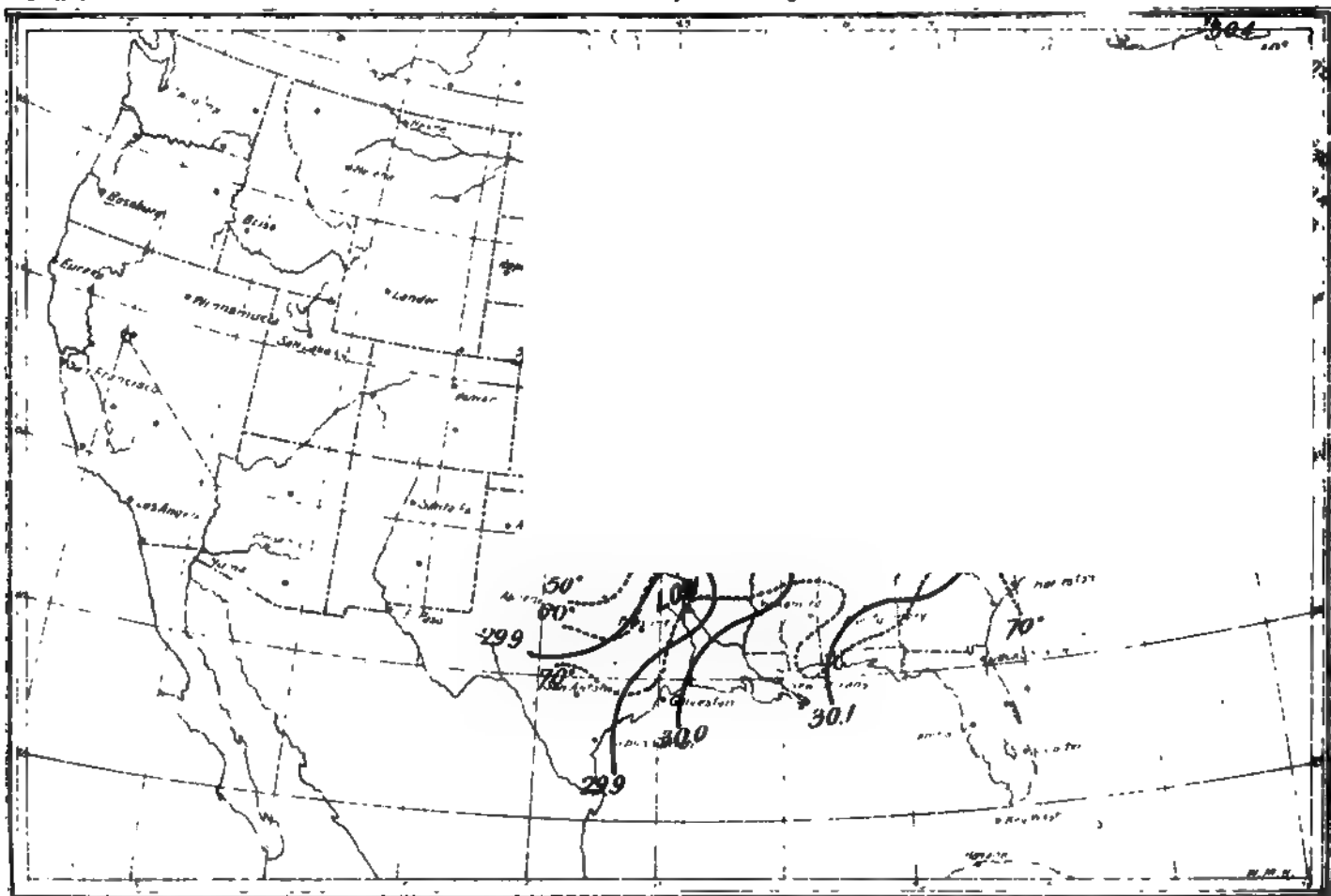


Chart DCCCLVII.

December 4, 1880—7 a. m.

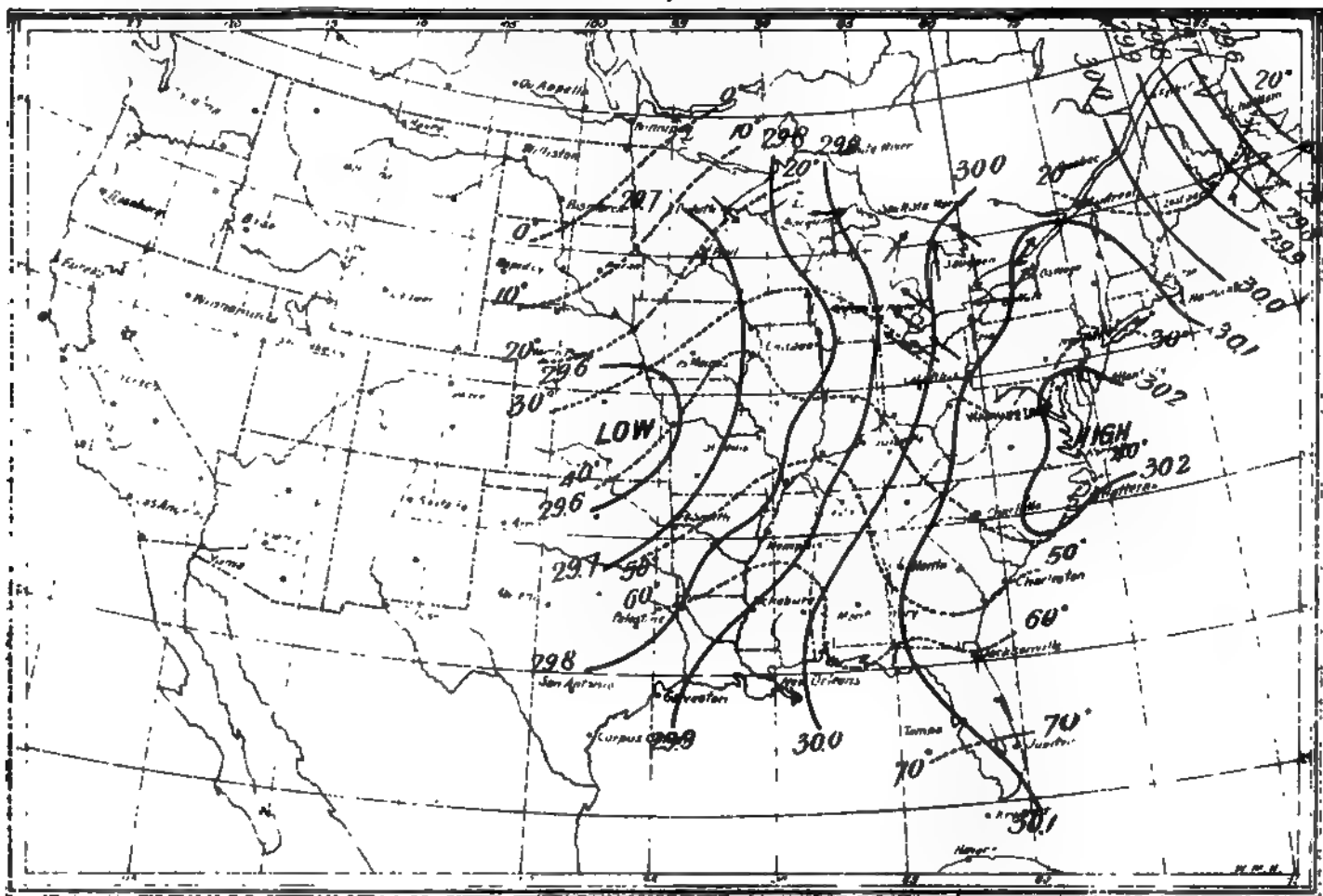


Chart DCCCLVIII.

December 4, 1880—3 p. m.

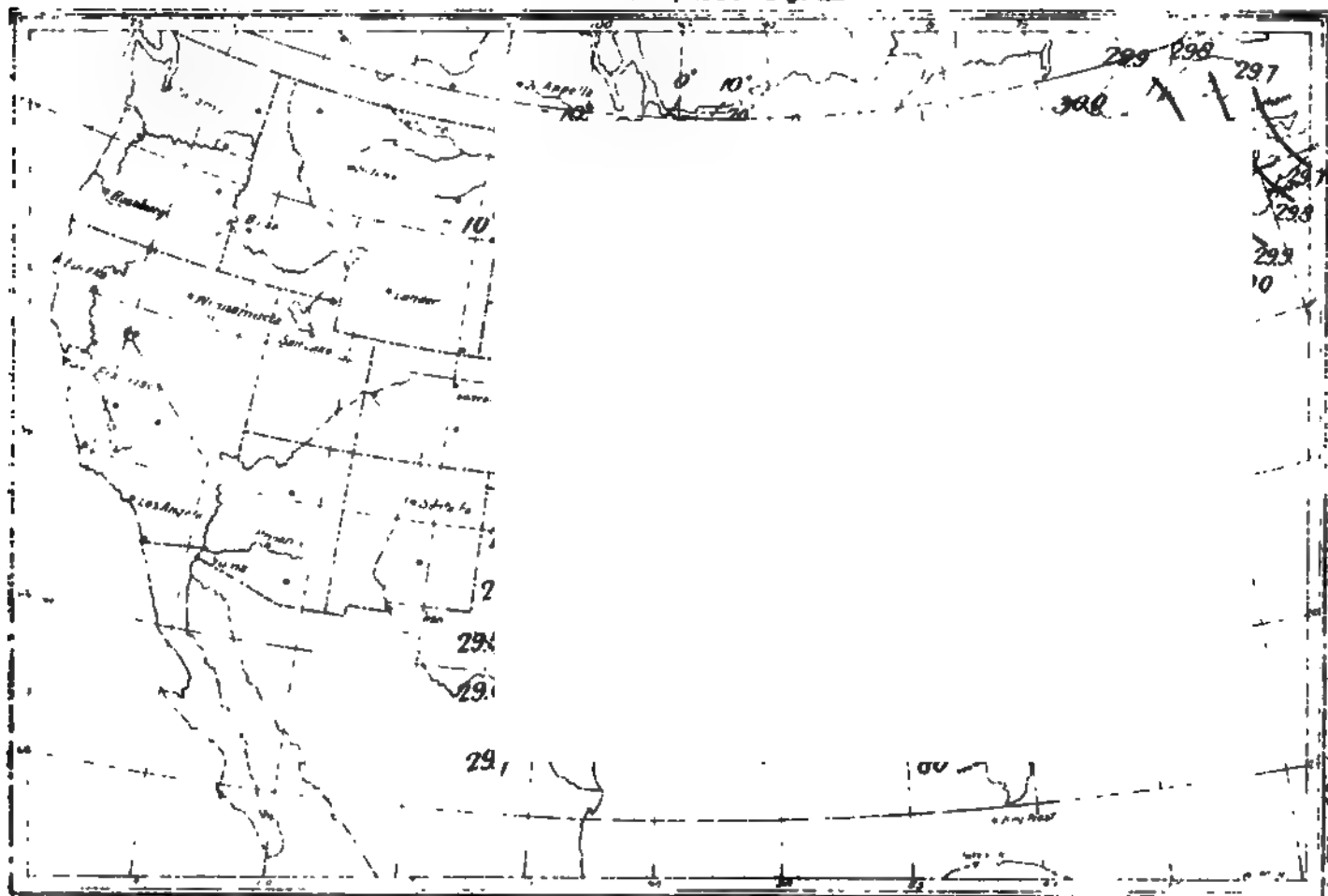
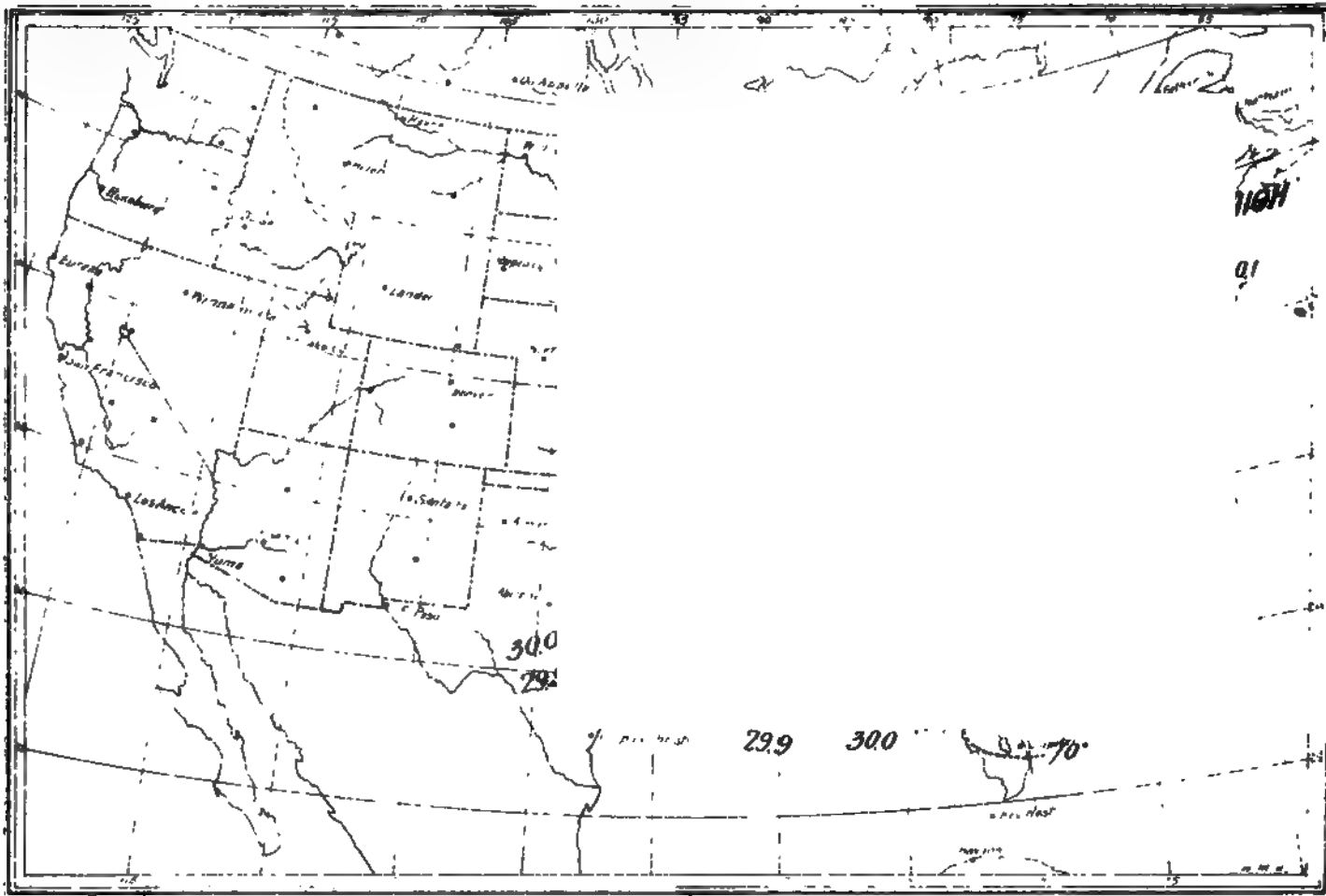


Chart DOOLIX.

December 5, 1880—7 a. m.

**Chart DOOLX.**

December 5, 1880—8 p. m.

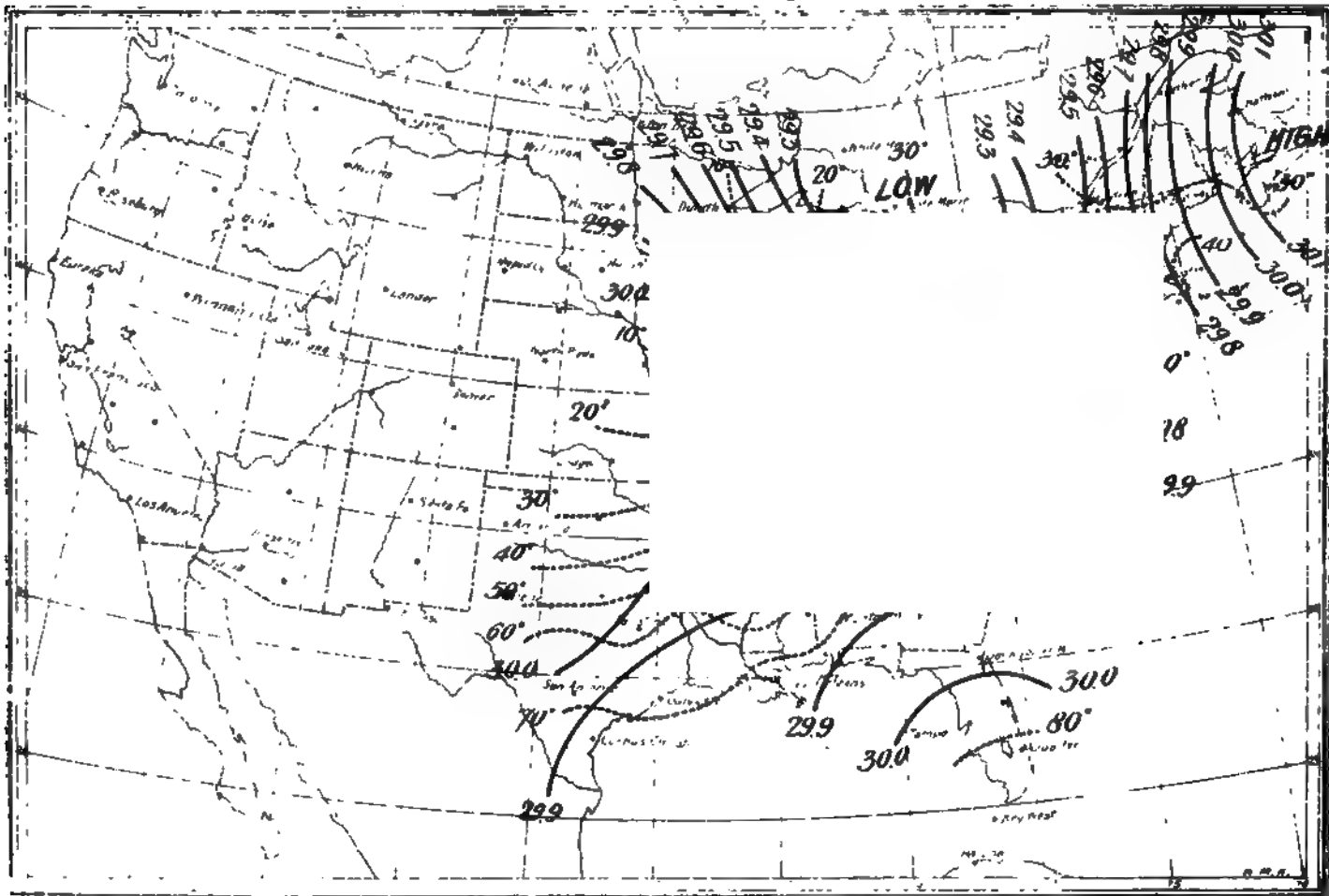


Chart D000LXI.

December 23, 1888—7 a. m.

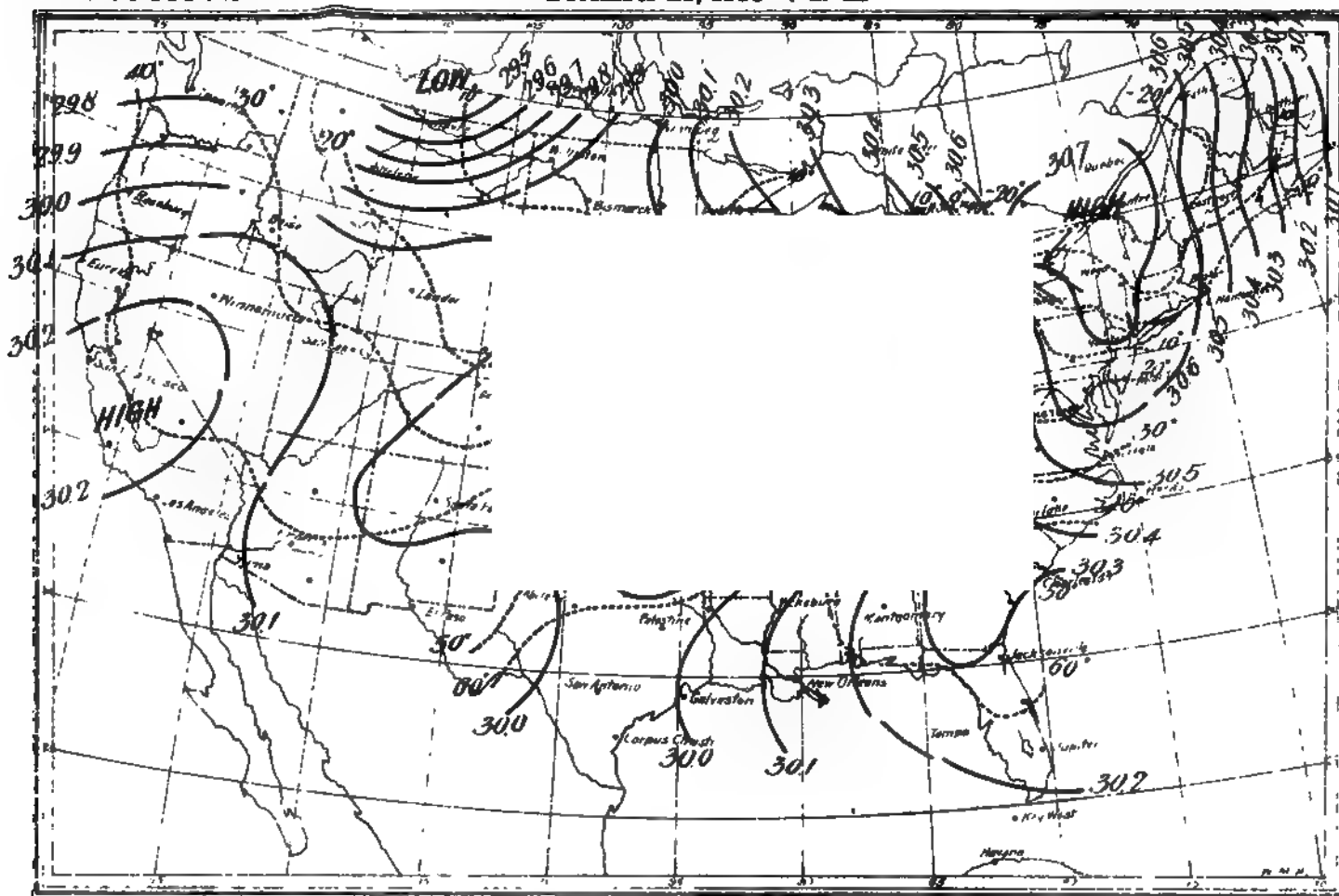


Chart D000LXII.

December 23, 1888—3 p. m.

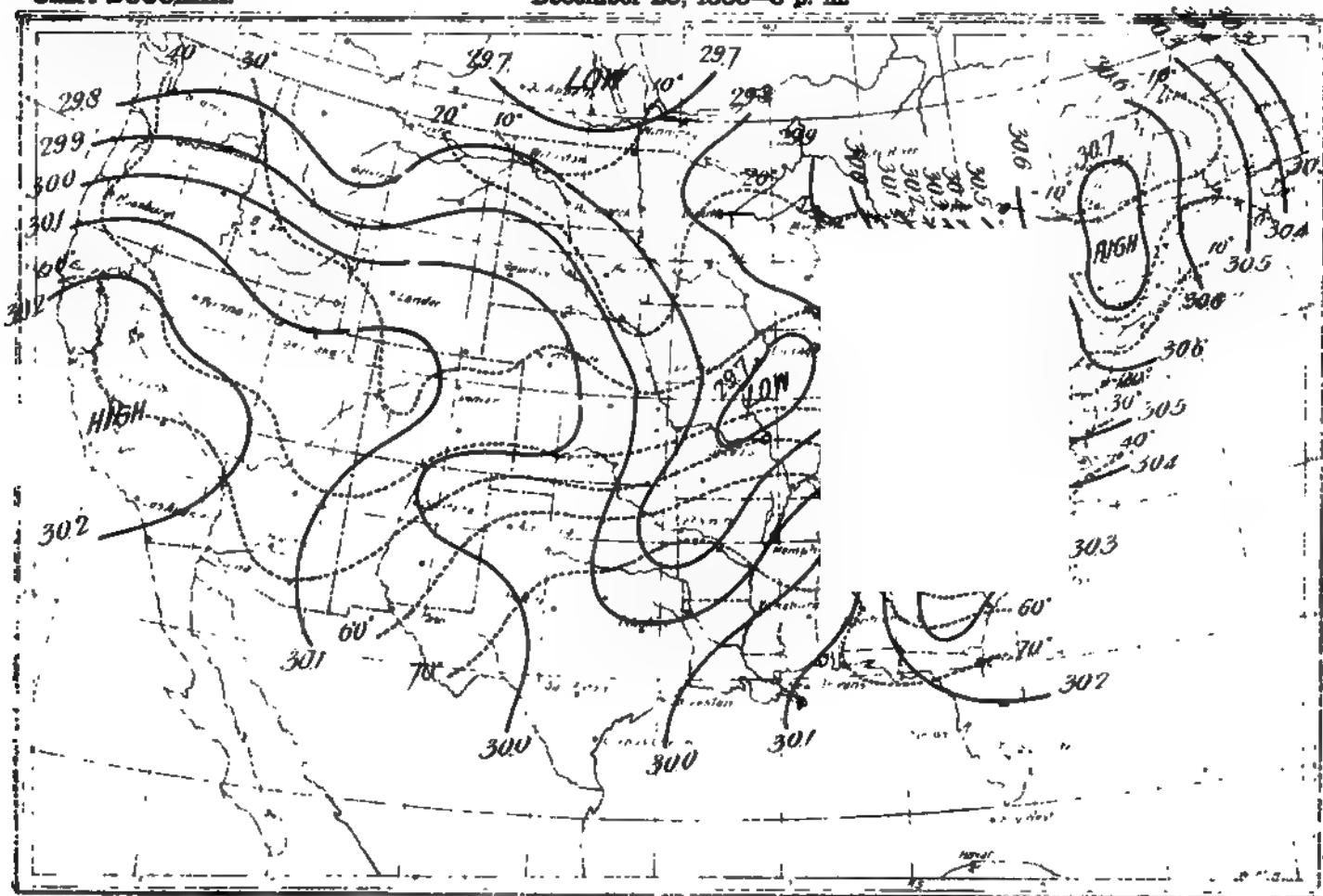


Chart DOOGLXIII.

December 24, 1888—7 a. m.

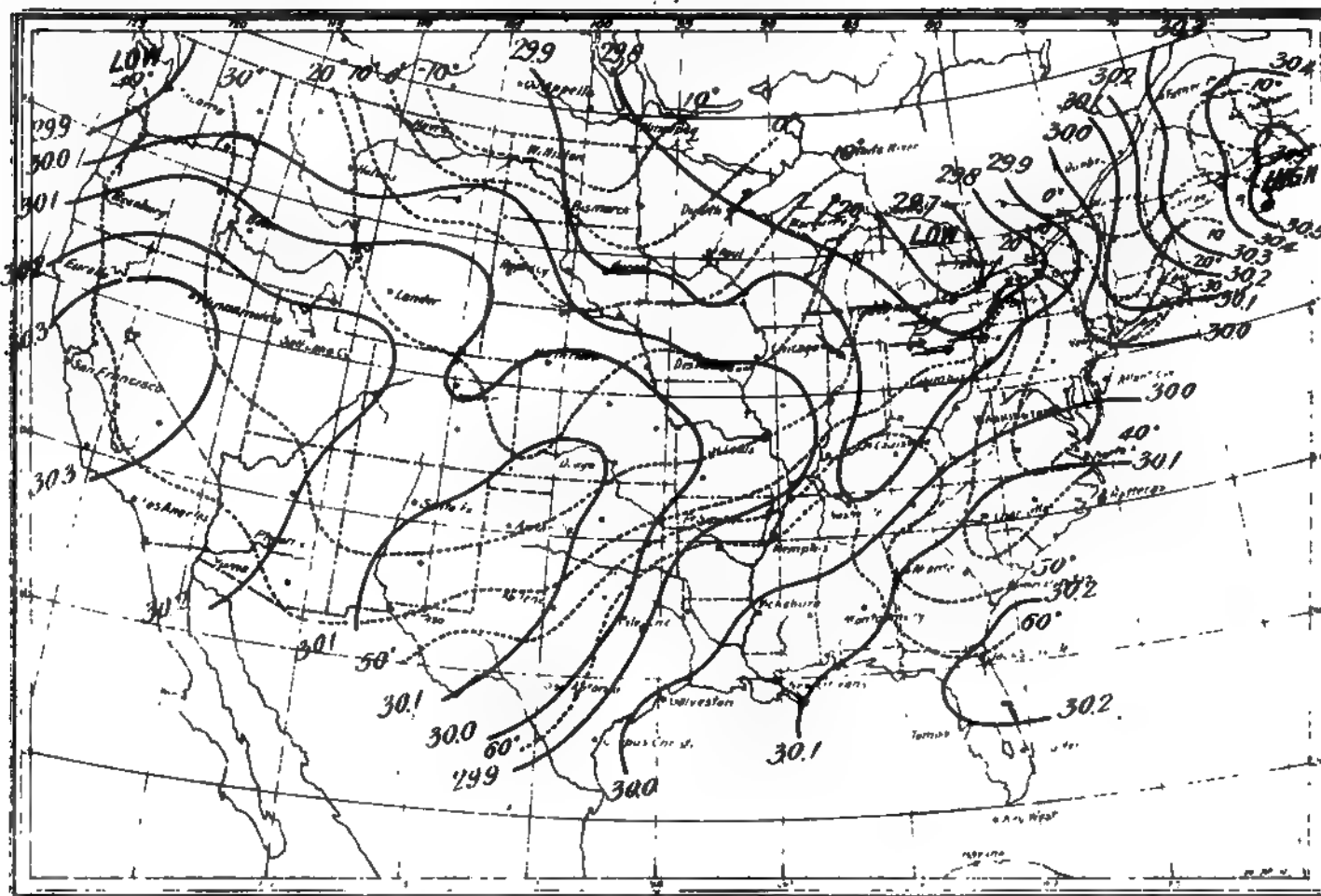


Chart DOOGLXIV.

December 24, 1888—3 p. m.

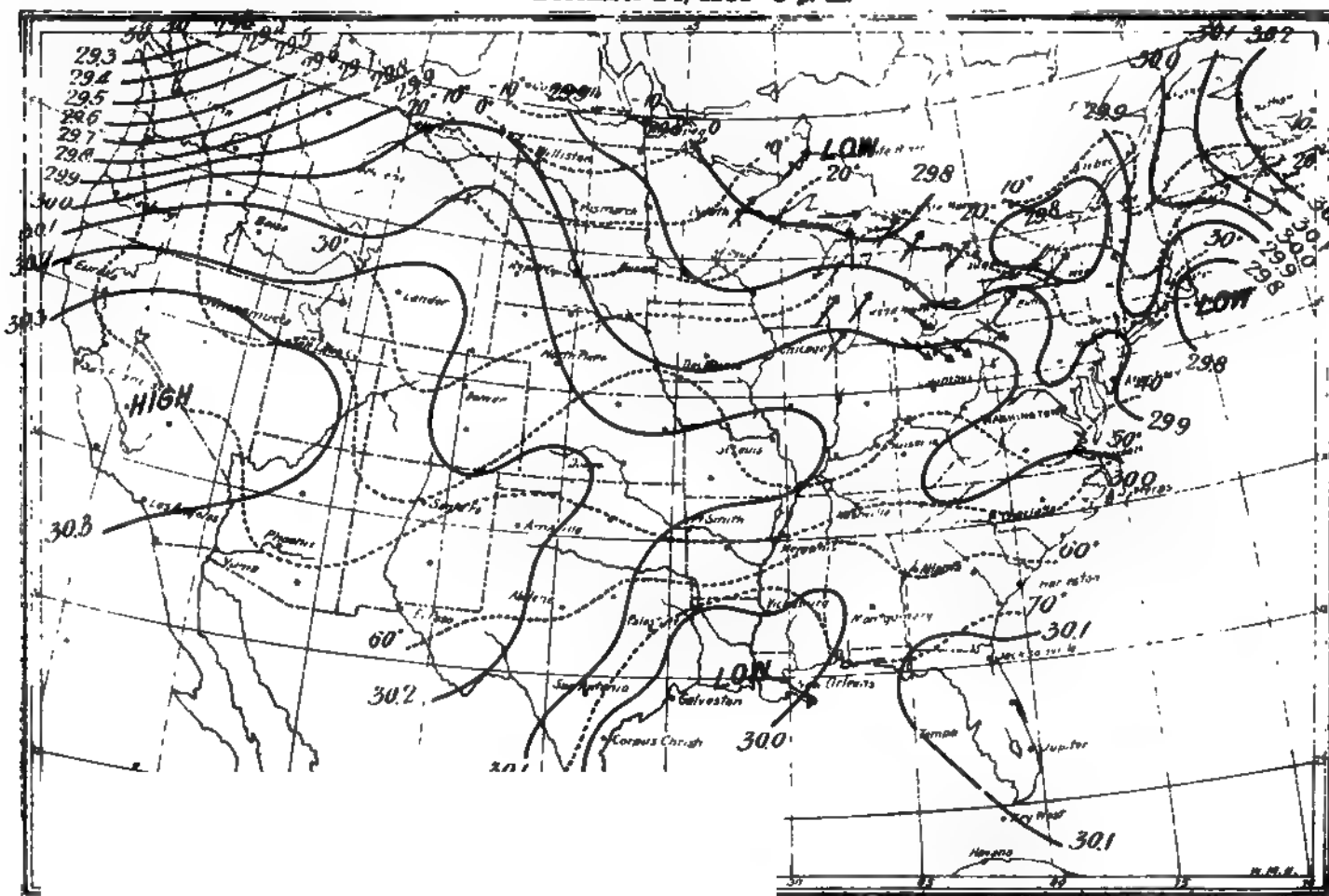


Chart DOOOLXV.

December 26, 1888—7 a. m.

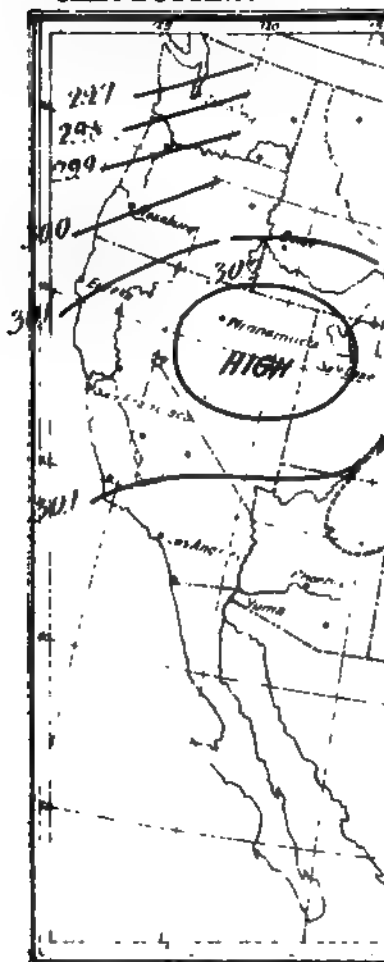


Chart DOOOLXVI

December 26, 1888—3 p. m.

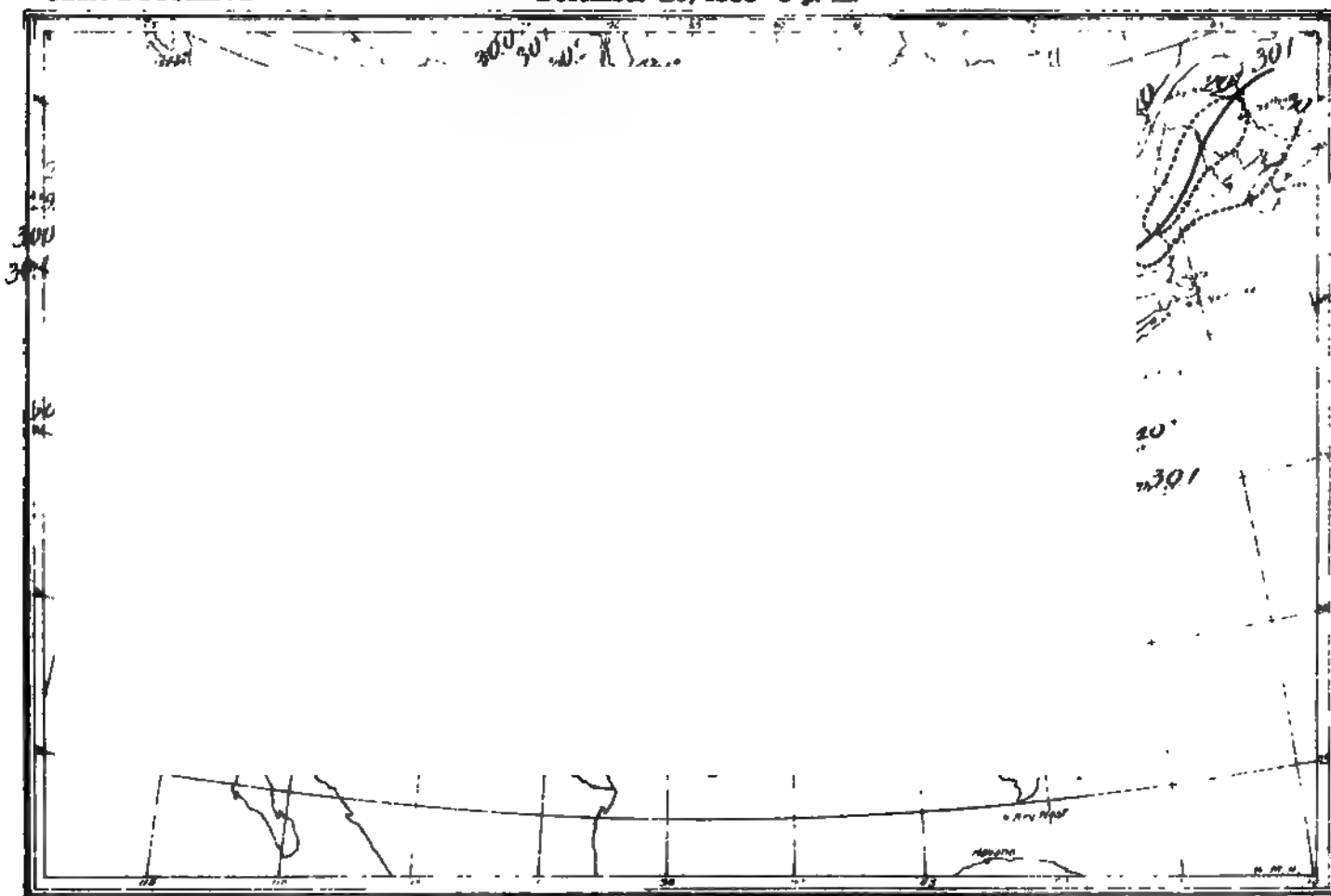


Chart DOOOLXVII.

December 27, 1883—7 a. m.

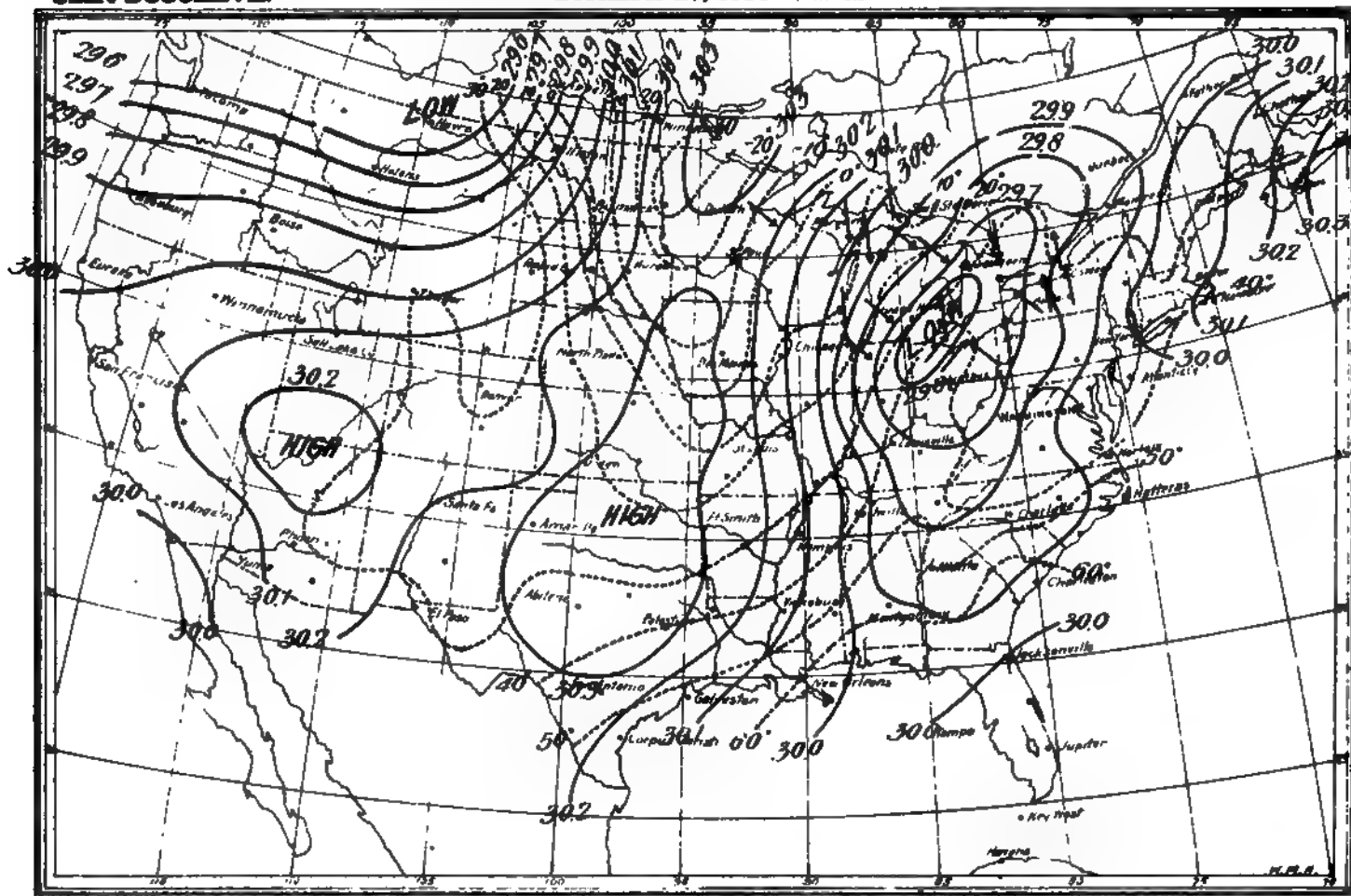


Chart DOOOLXVIII.

December 27, 1883—3 p. m.

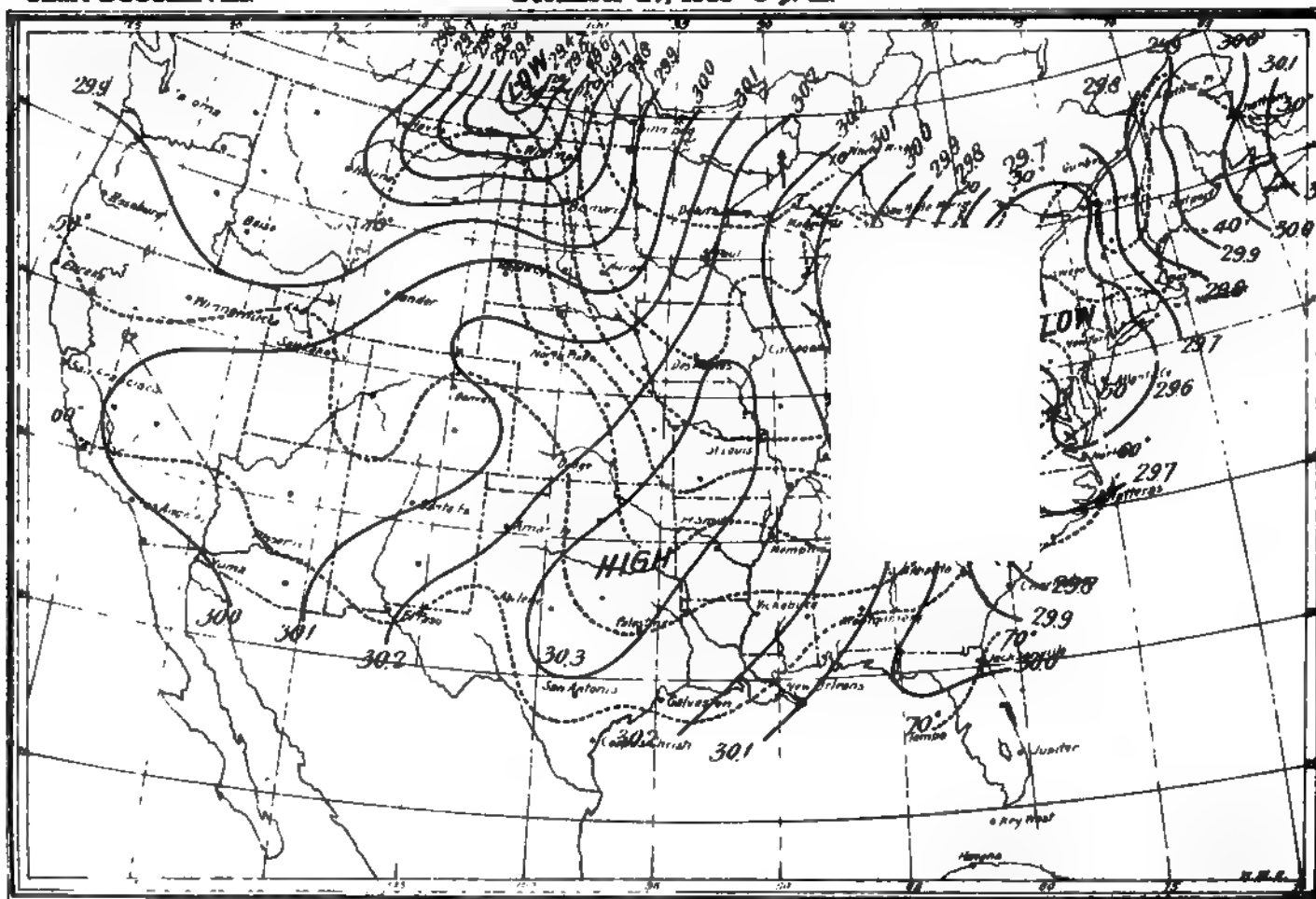


Chart DOOOLXX.

December 5, 1884—7 a. m.

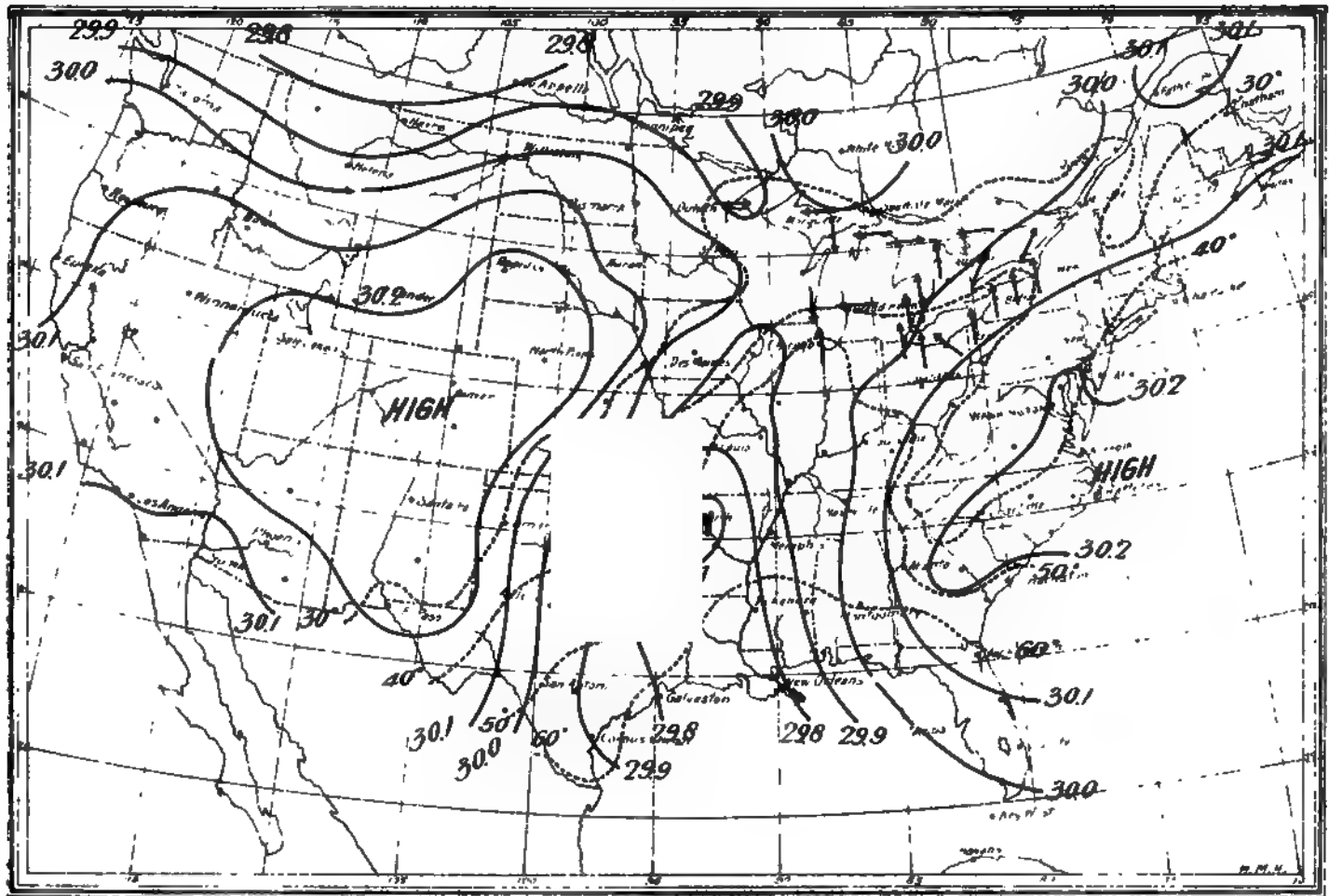


Chart DOOOLXX.

December 5, 1884—3 p. m.

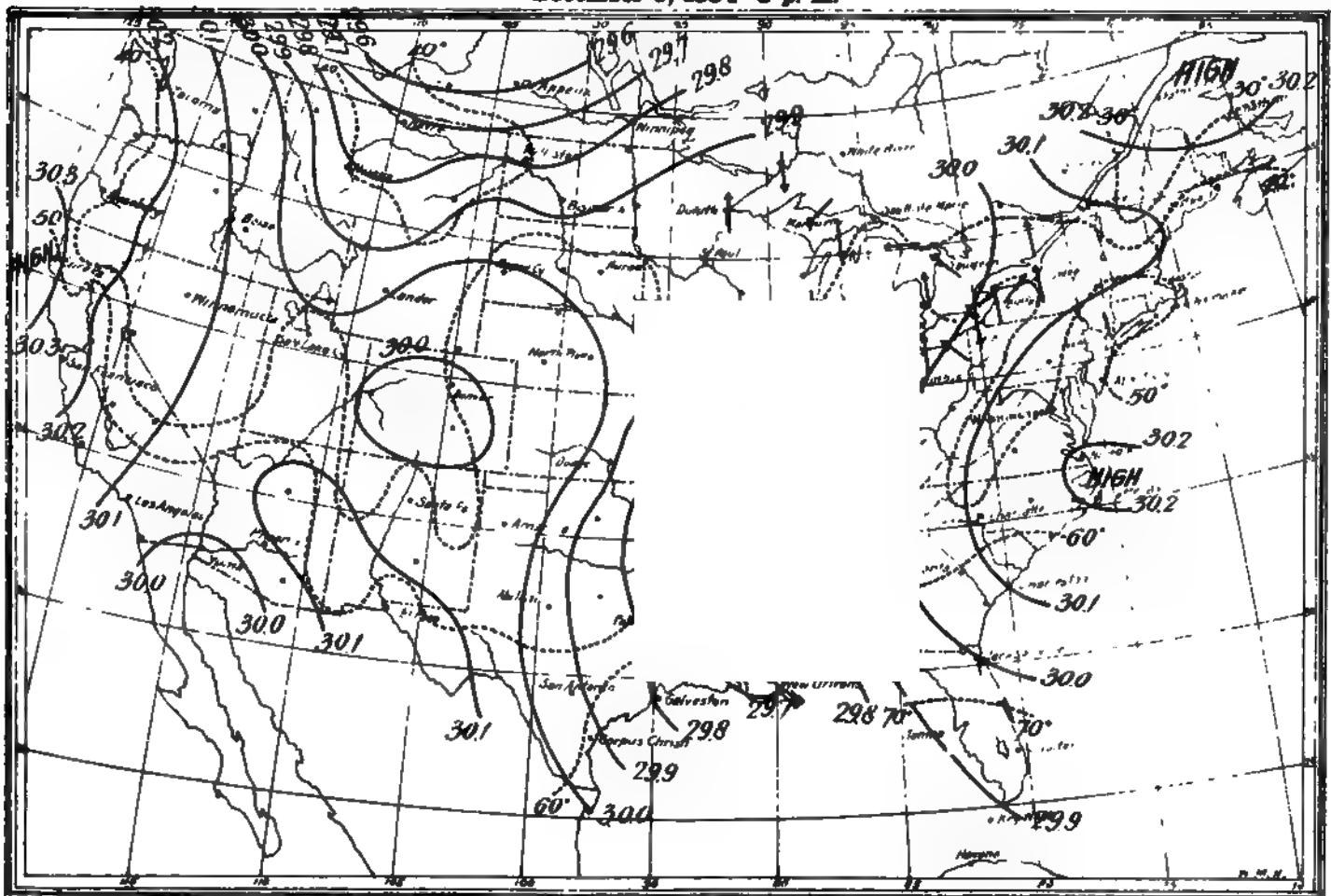


Chart DOOCLXXI

December 6, 1894—7 a. m.

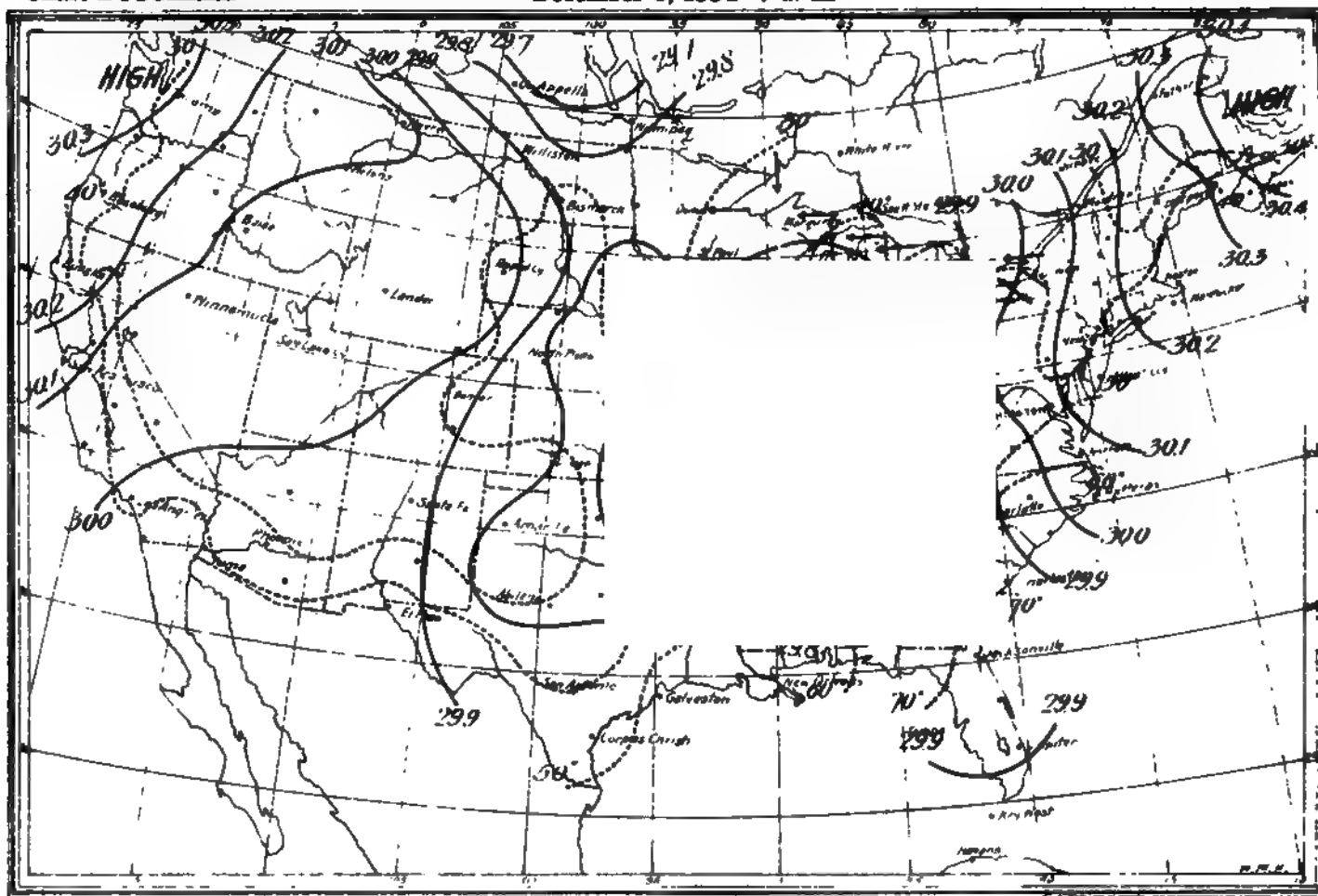


Chart DOOCLXXII

December 6, 1894—3 p. m.

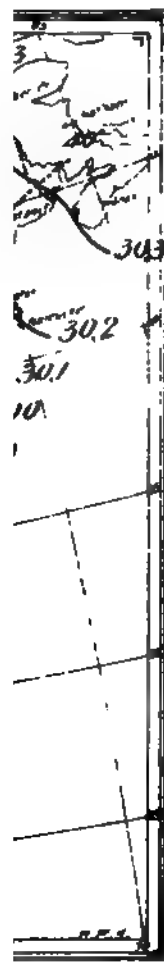


Chart DCOOLXXIII.

December 14, 1884—7 a. m.

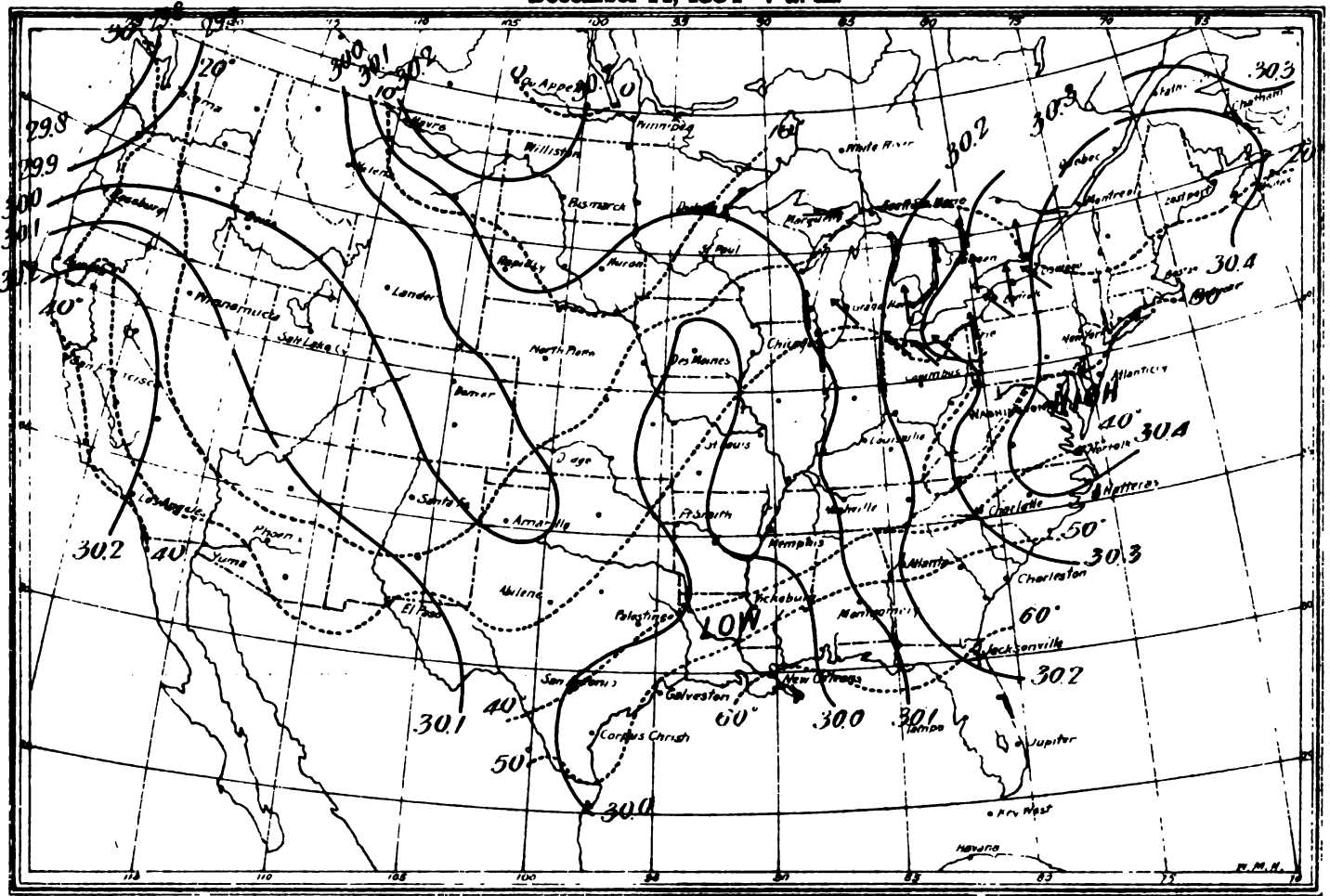
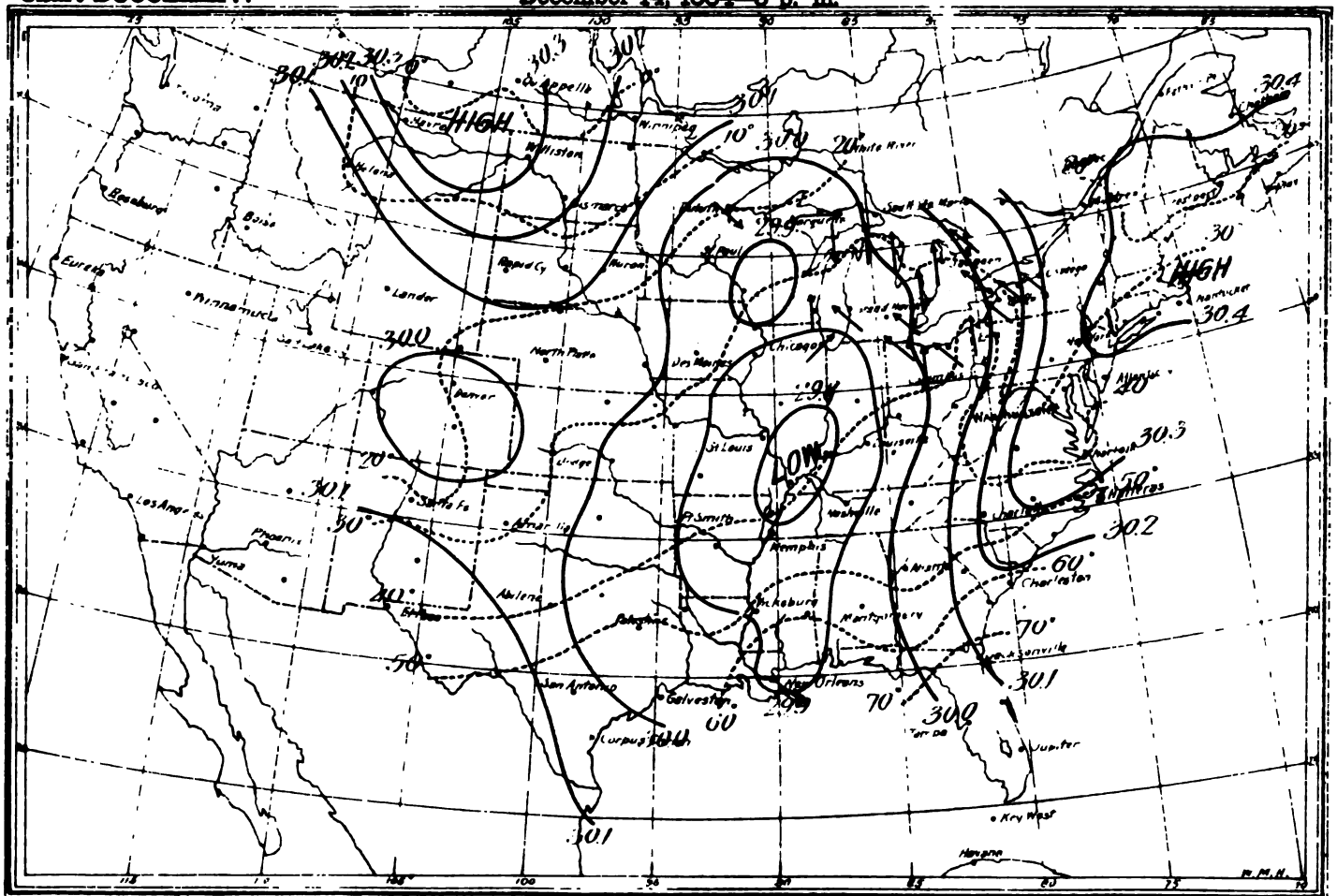


Chart DCOOLXXIV.

December 14, 1884—3 p. m.



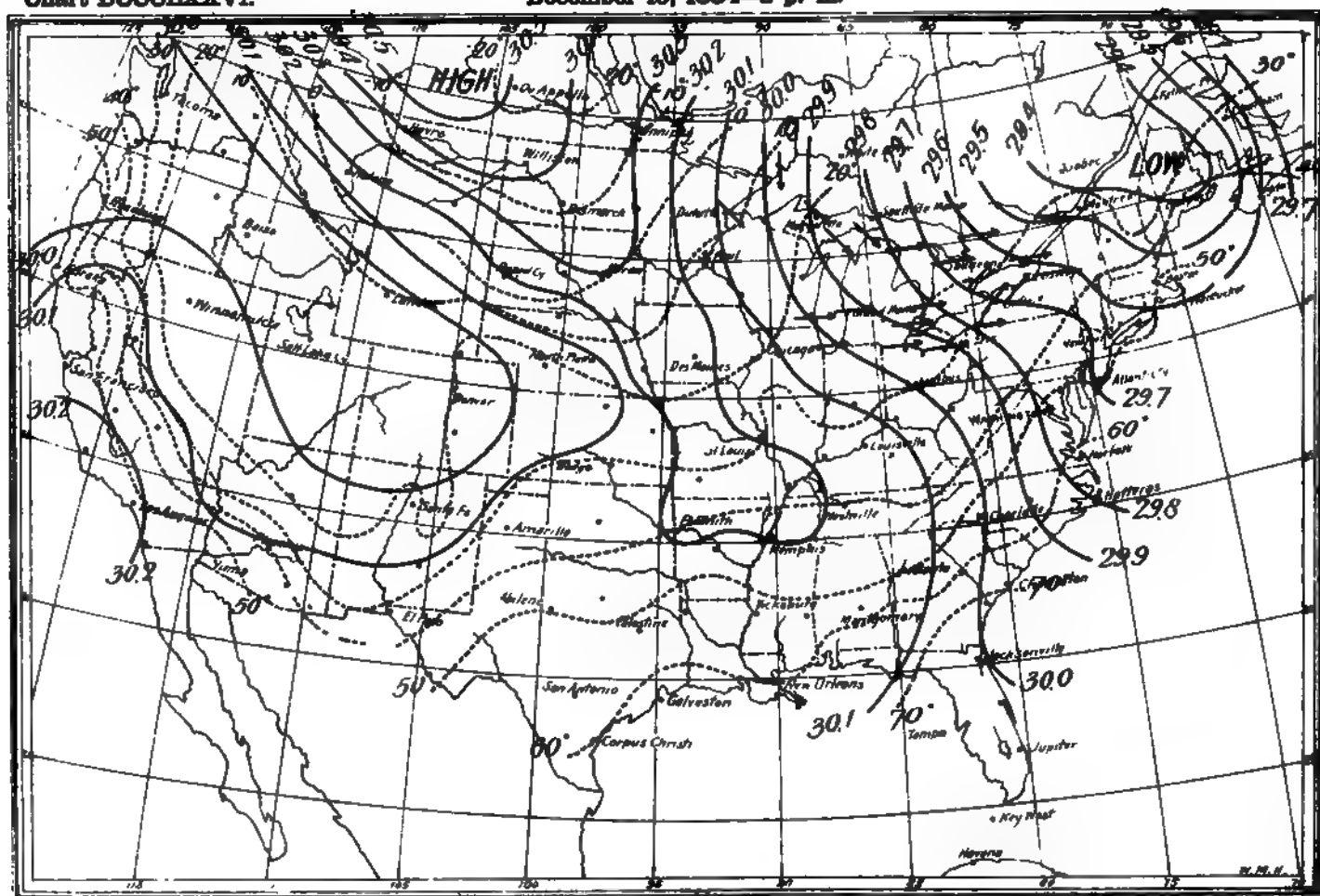


Chart D000LXXVII

December 21, 1884—7 a. m.

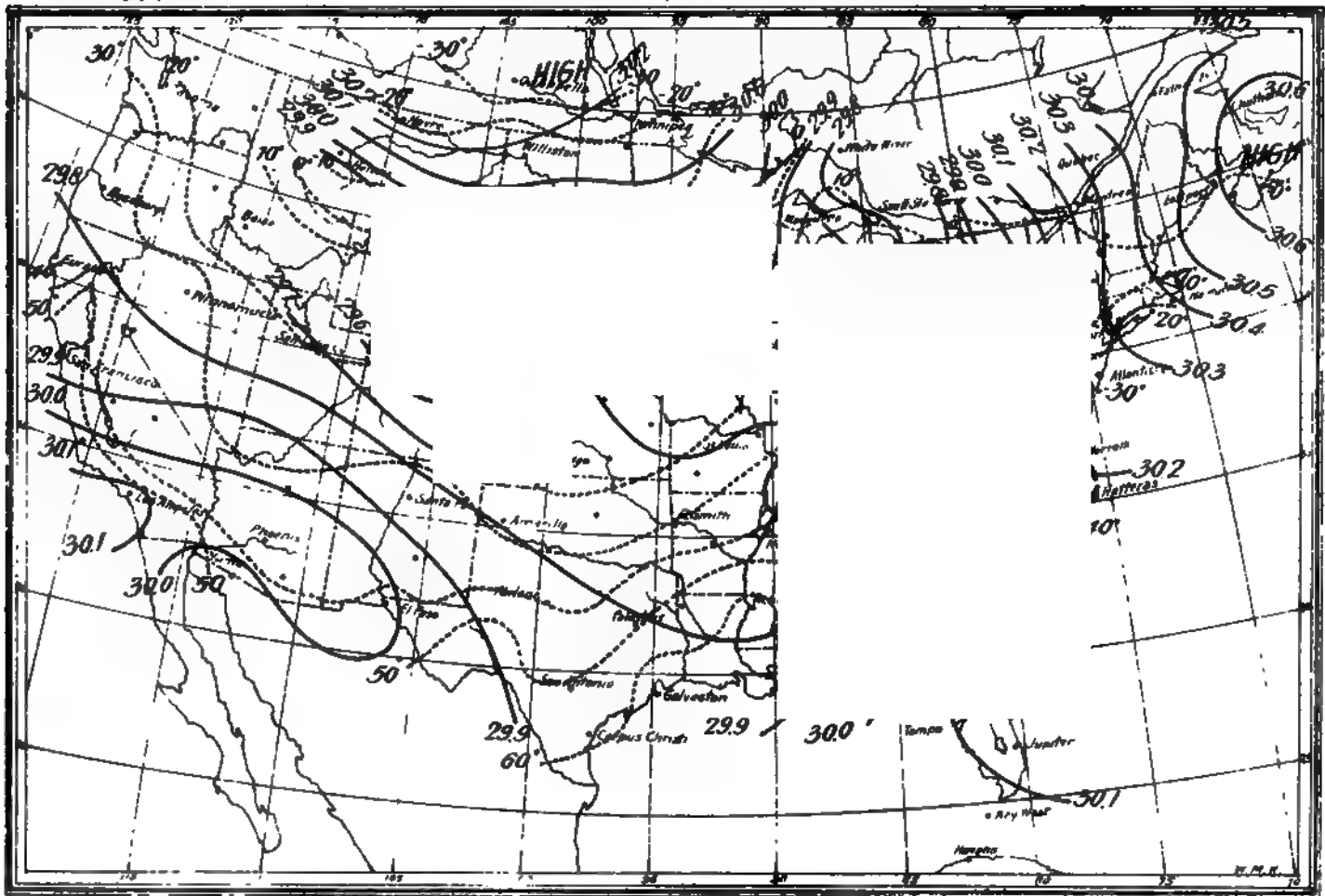
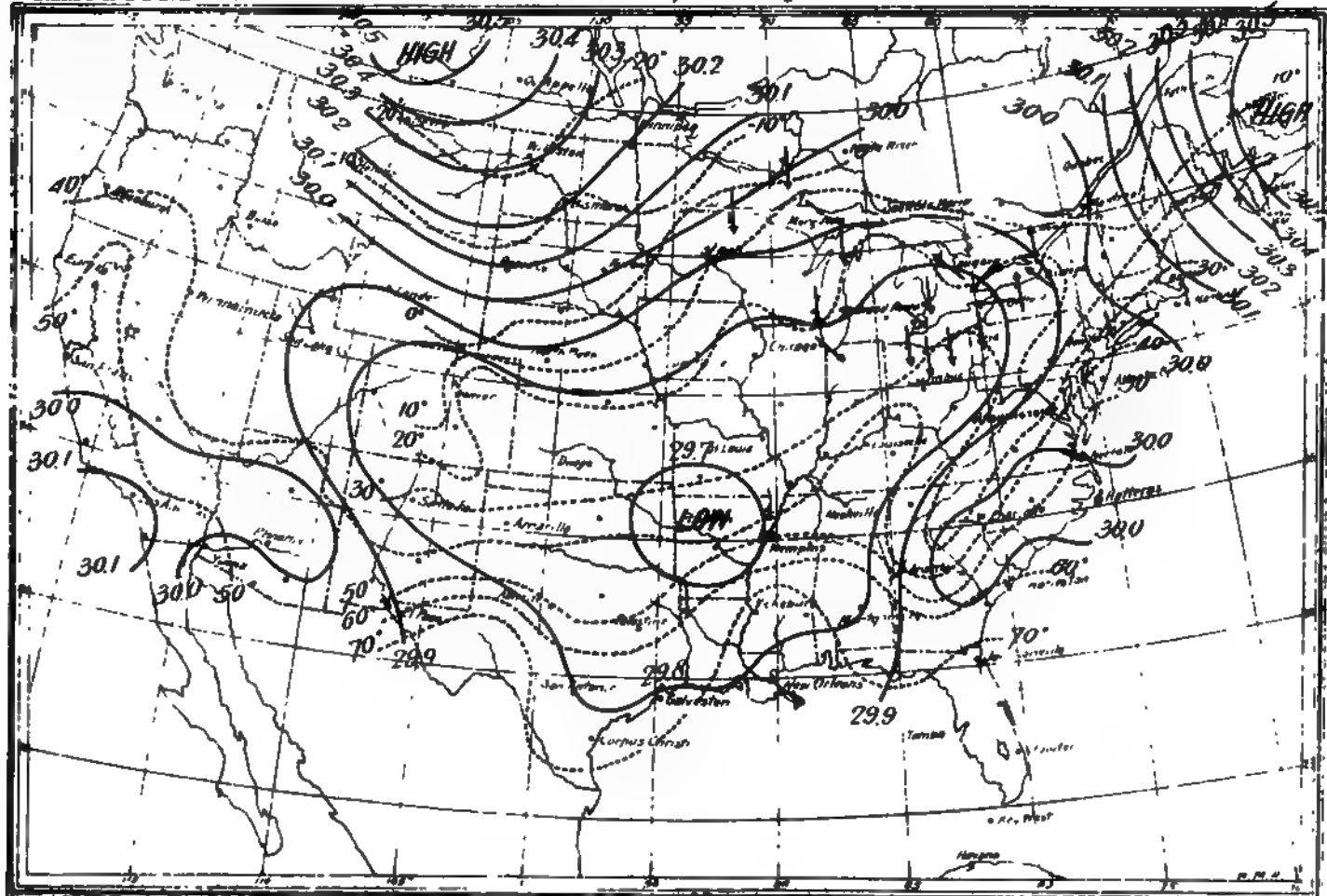
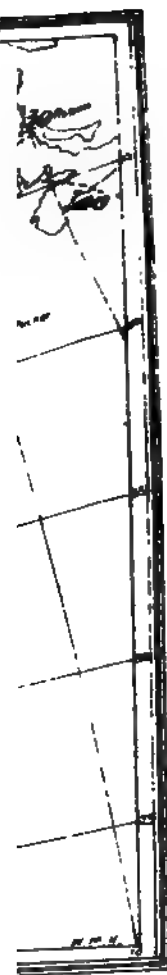


Chart D000LXXVIII

December 21, 1884—3 p. m.



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December 22, 1884—3 p. m.

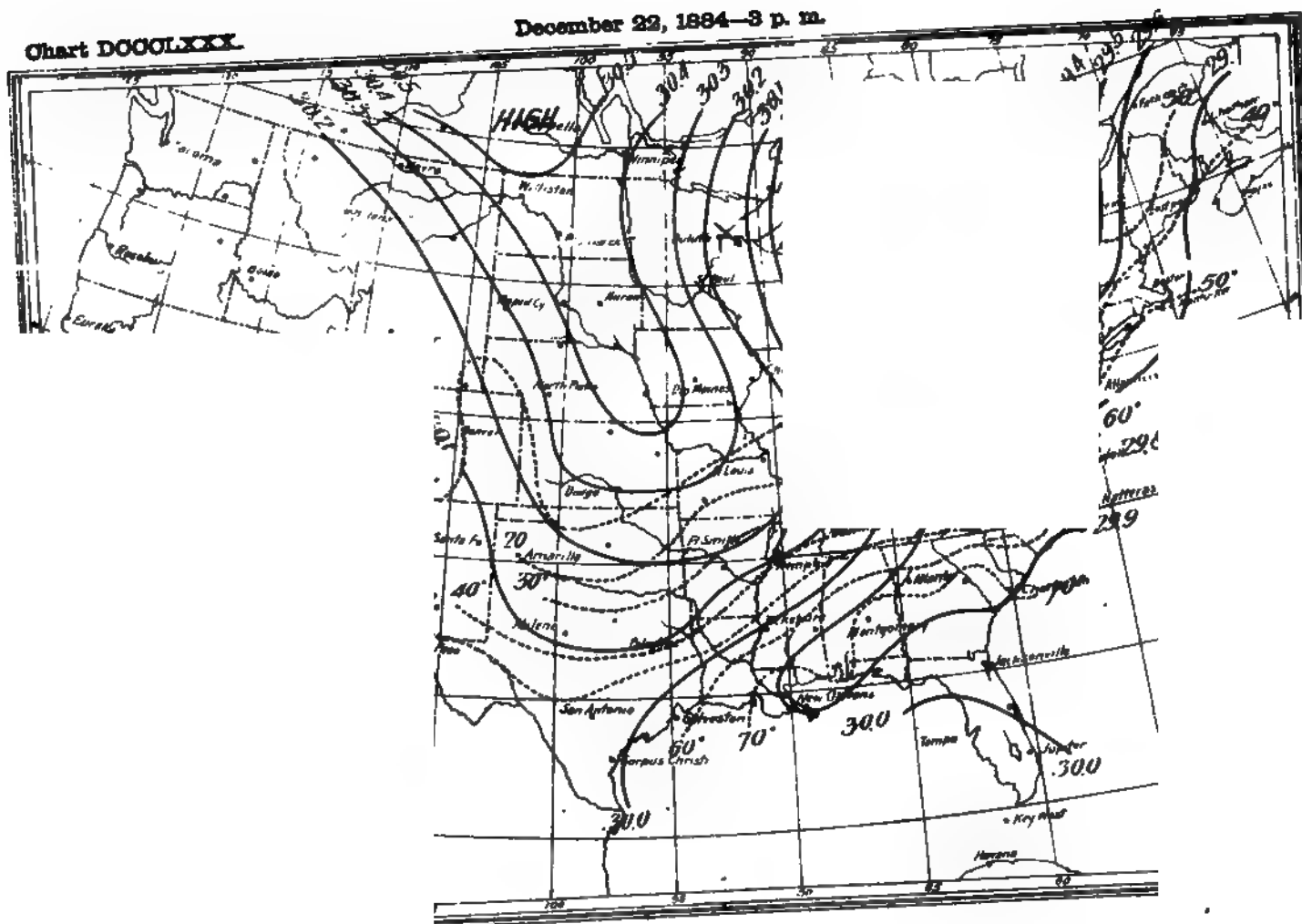


Chart D000LXXXI.

December 3, 1885-7 a. m.

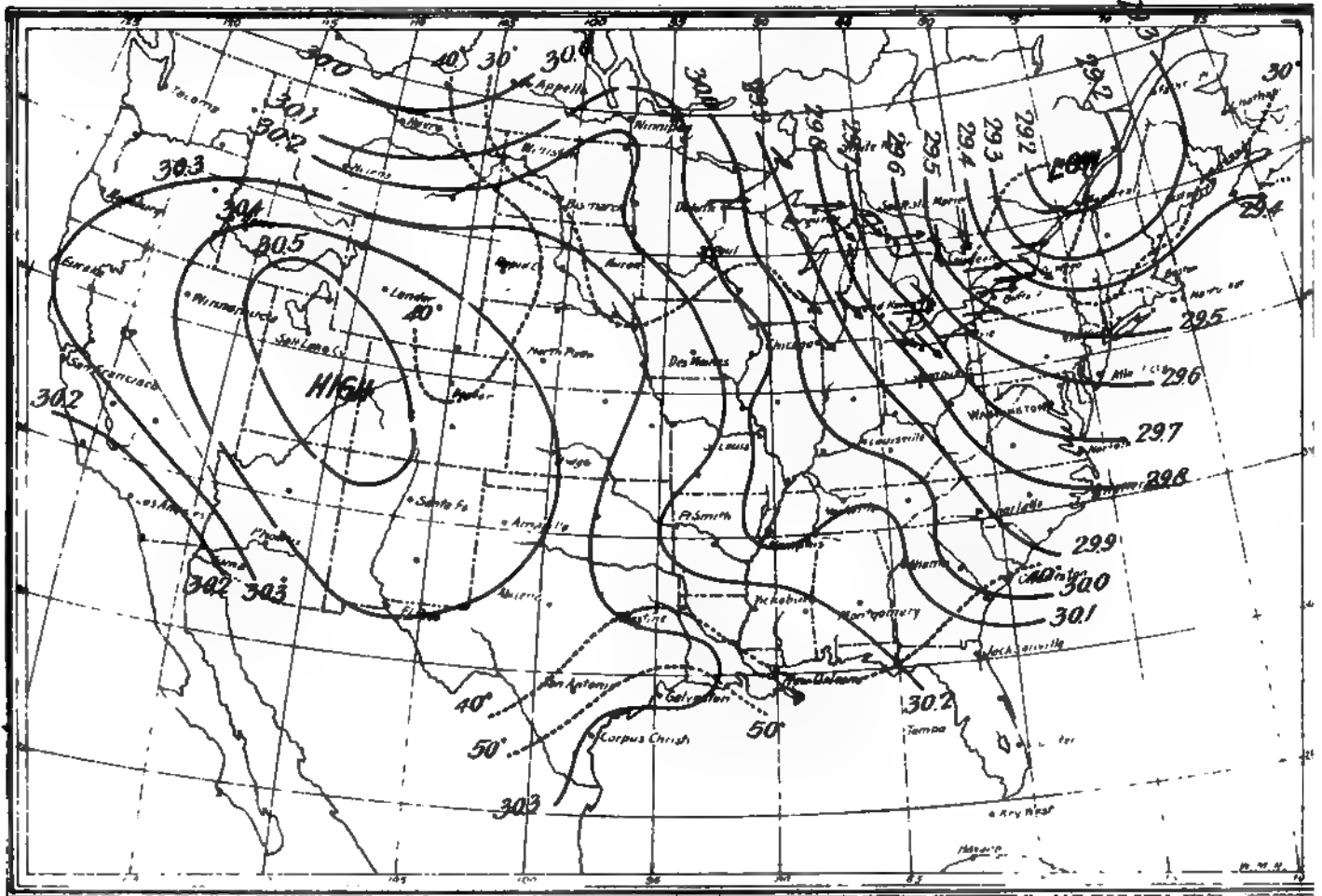


Chart D000LXXXII.

December 3, 1885-3 p. m.

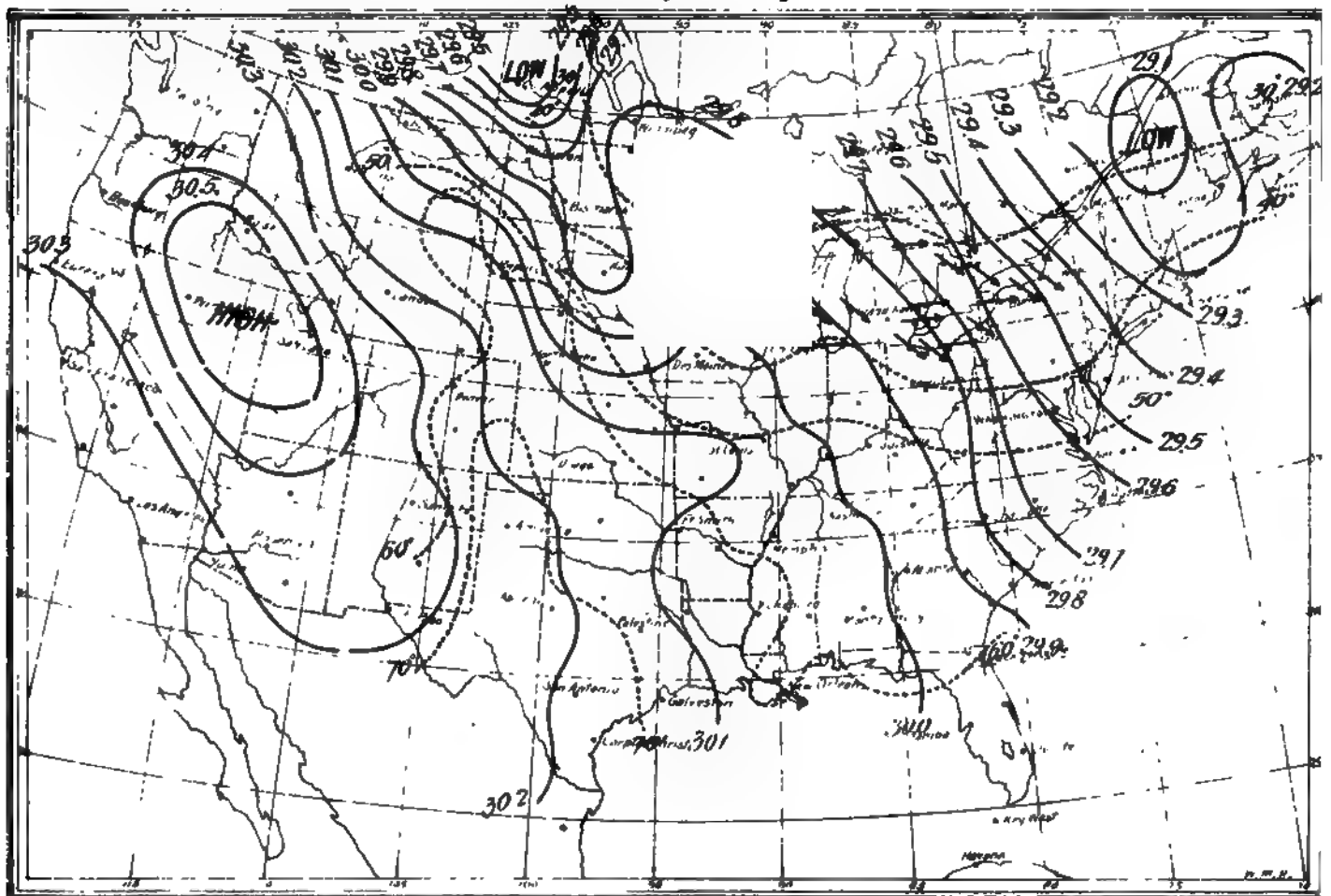


Chart D000LXXXIII.

December 4, 1885—7 a. m.

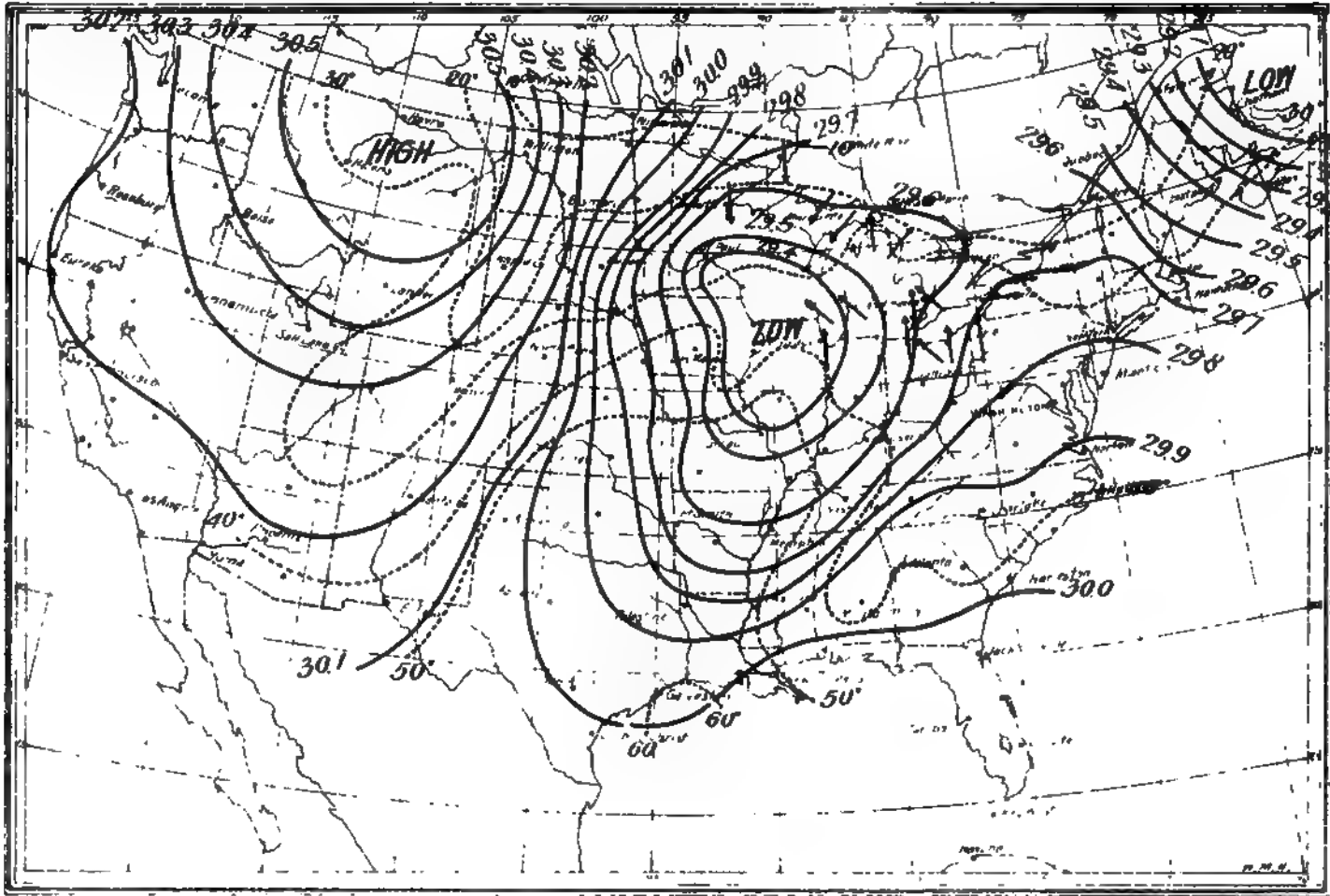


Chart D000LXXXIV.

December 4, 1885—3 p. m.

Chart D000LXXXIX

December 1, 1886-7 a. m.

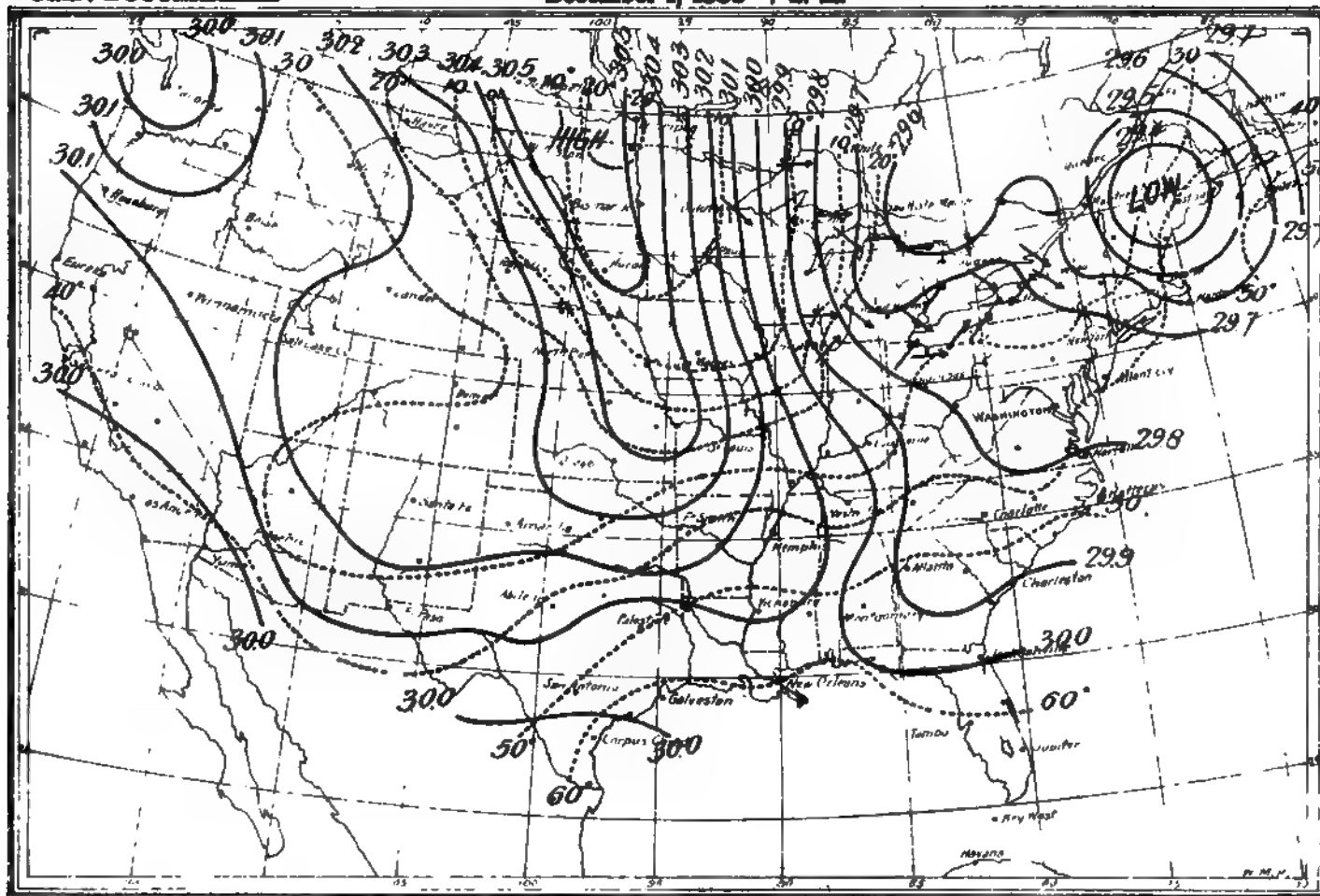


Chart D000XC.

December 1, 1886-8 p. m.

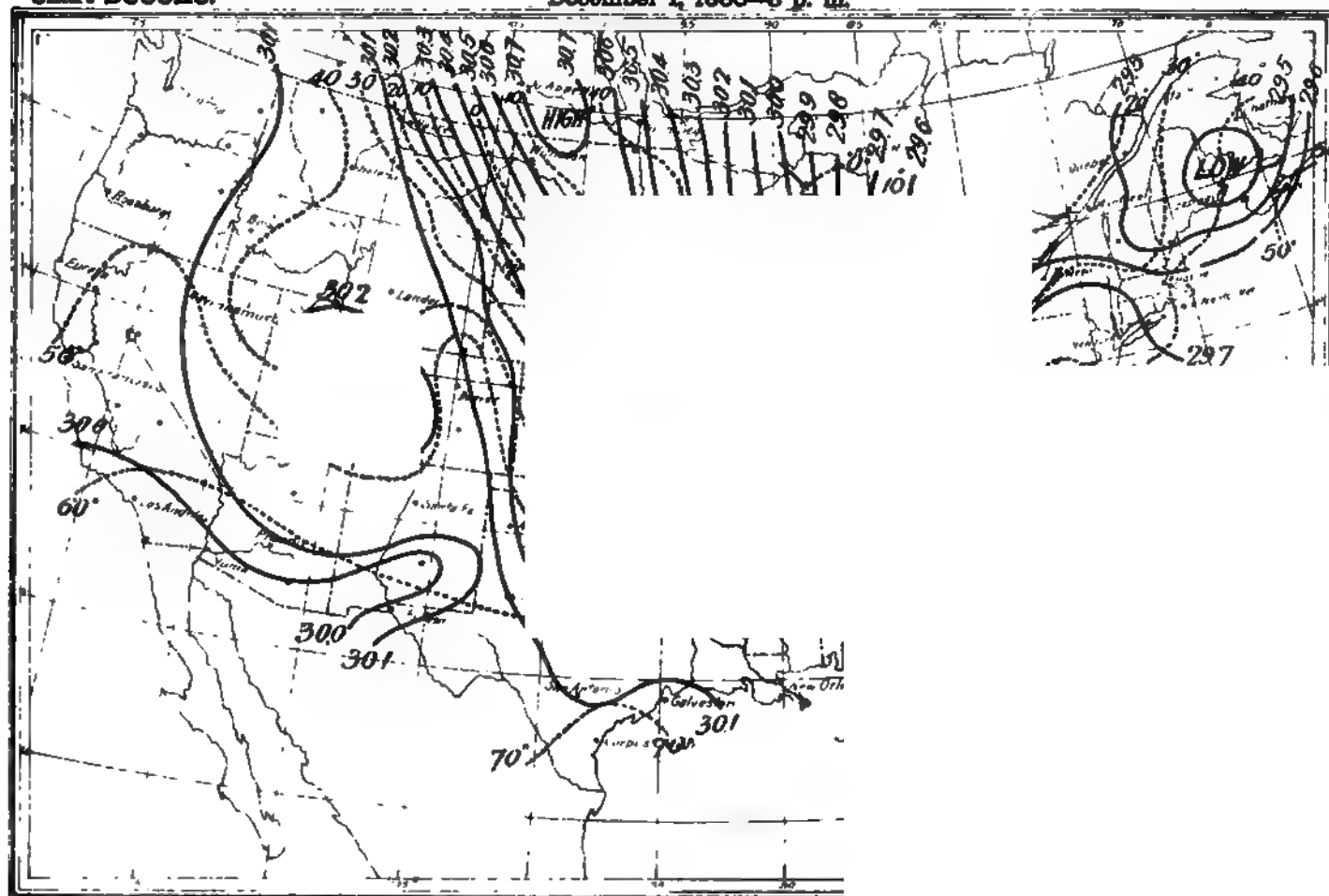


Chart D000X01

December 2, 1886—7 a. m.

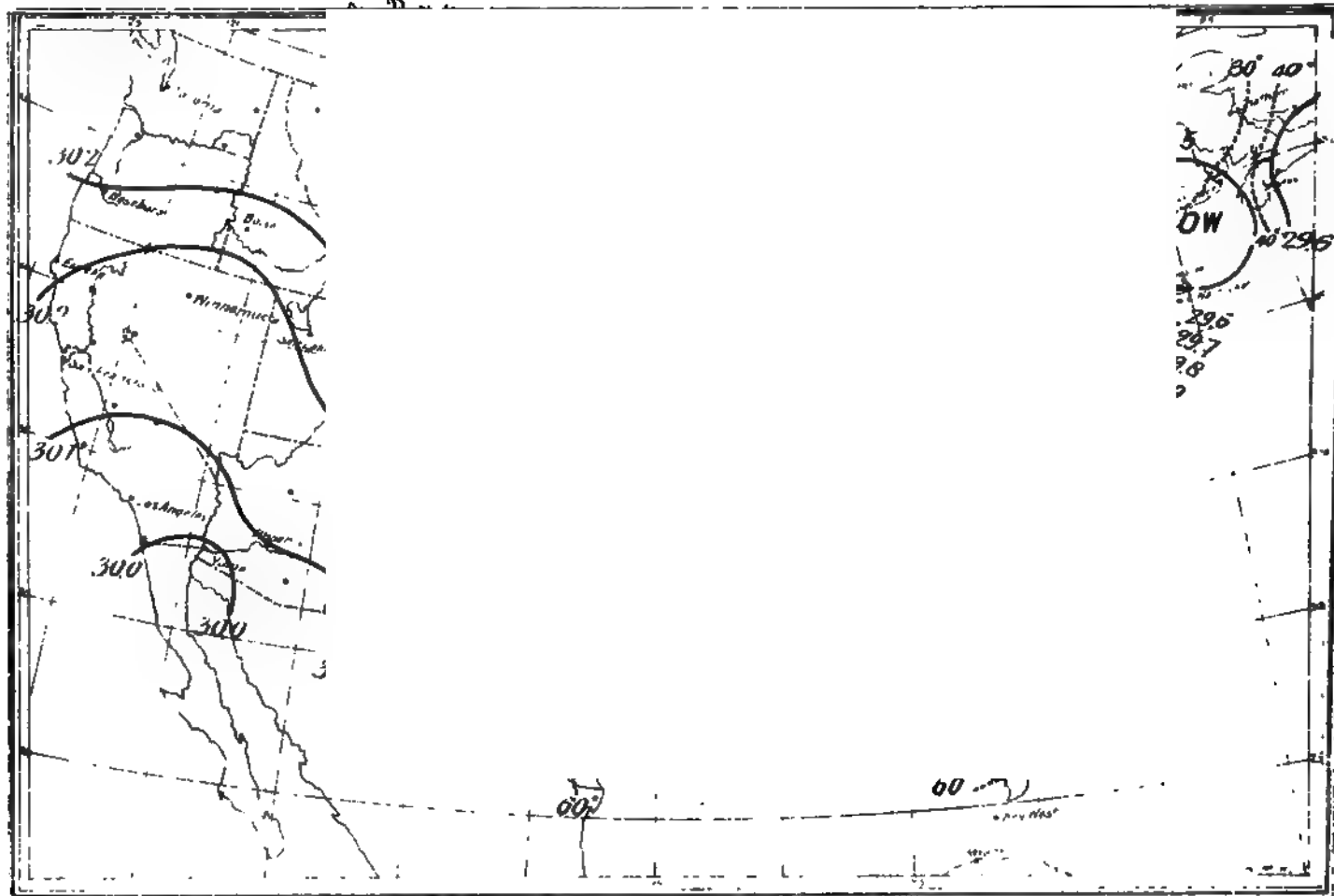


Chart D000X01

December 2, 1886—3 p. m.

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Chart DCCCXIII.

December 3, 1886—7 a. m.

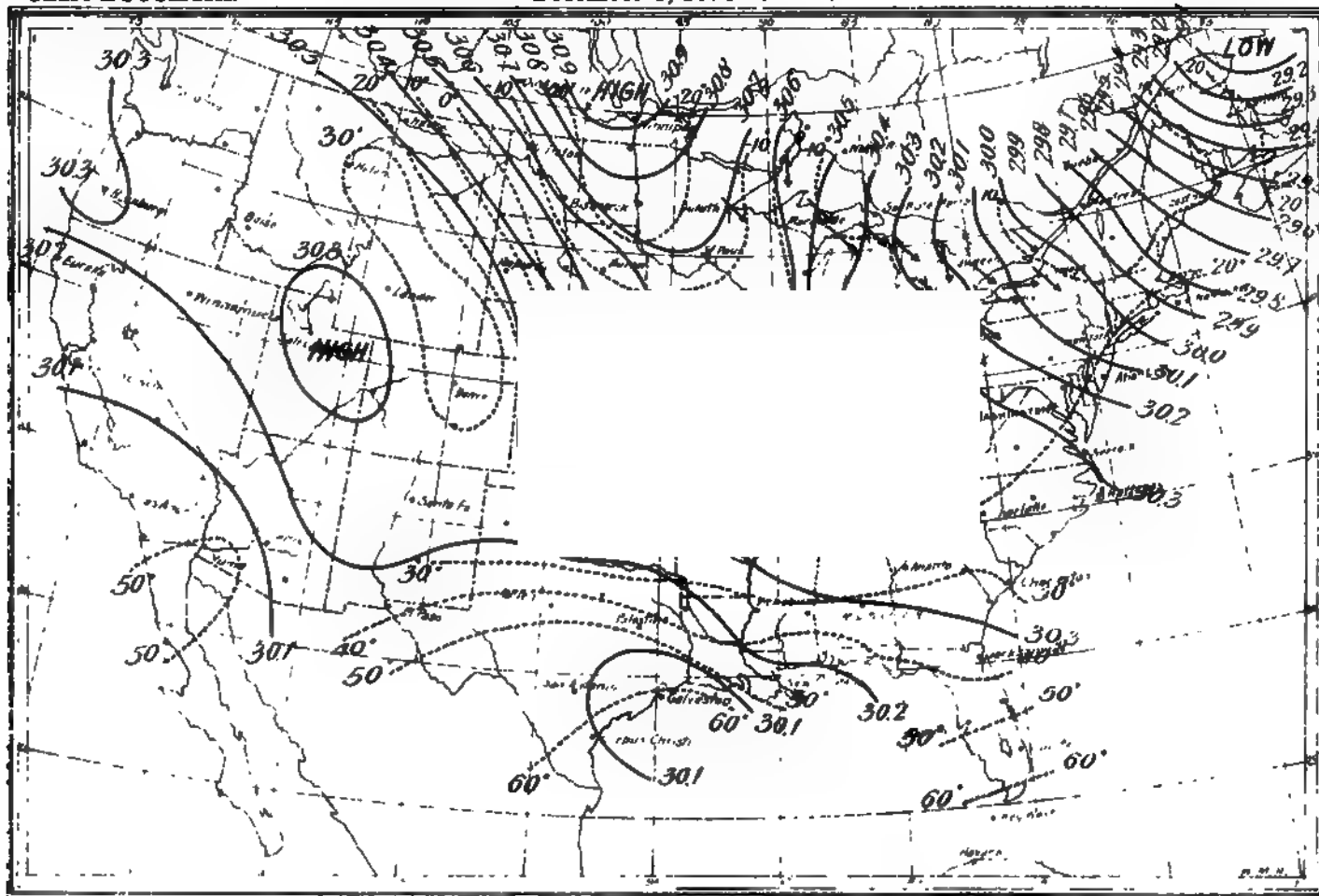


Chart DCCCXIV.

December 3, 1886—3 p. m.

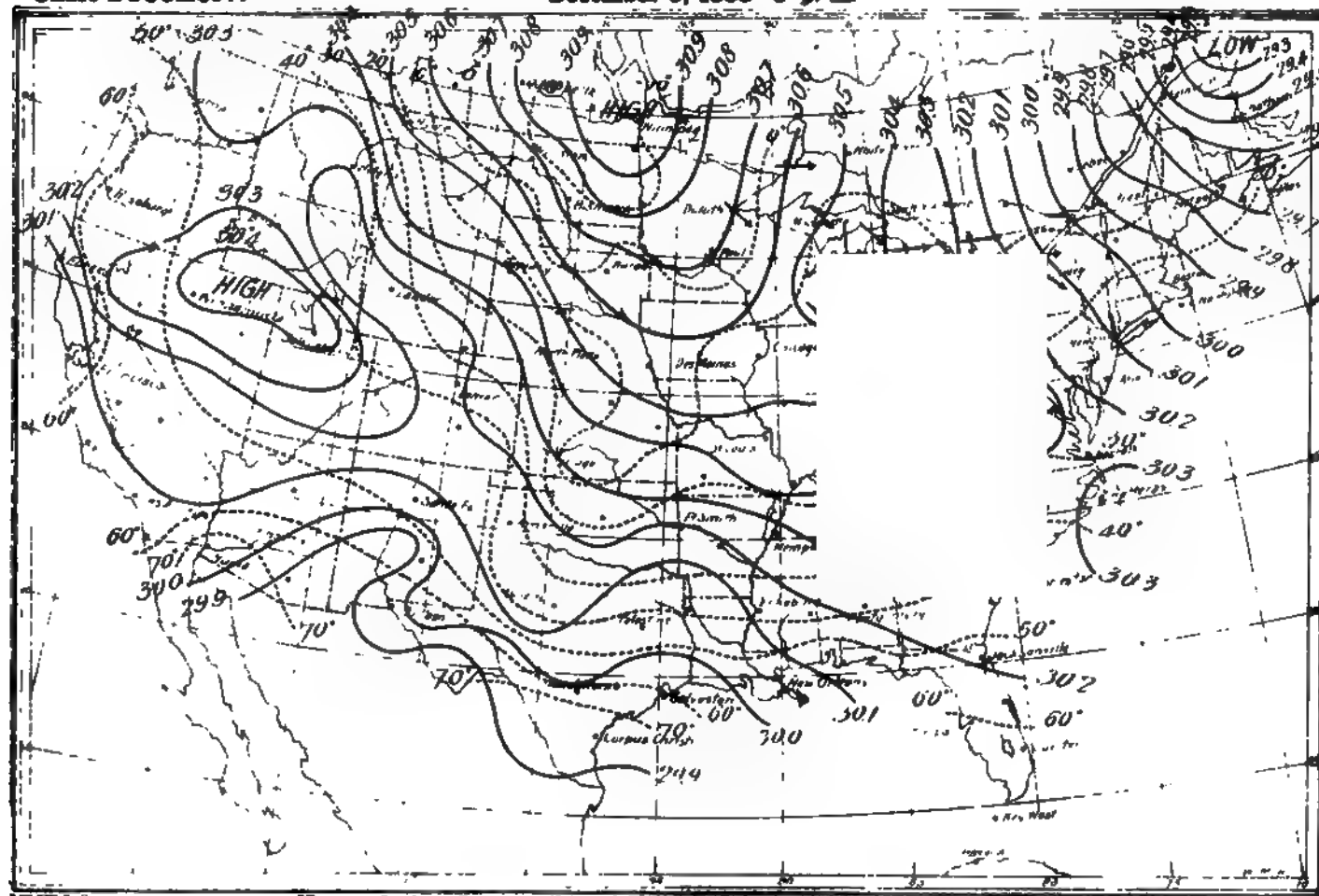


Chart D000X0V.

December 4, 1886—7 a. m.

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Chart D000XOVII.

December 4, 1888--8 a. m.

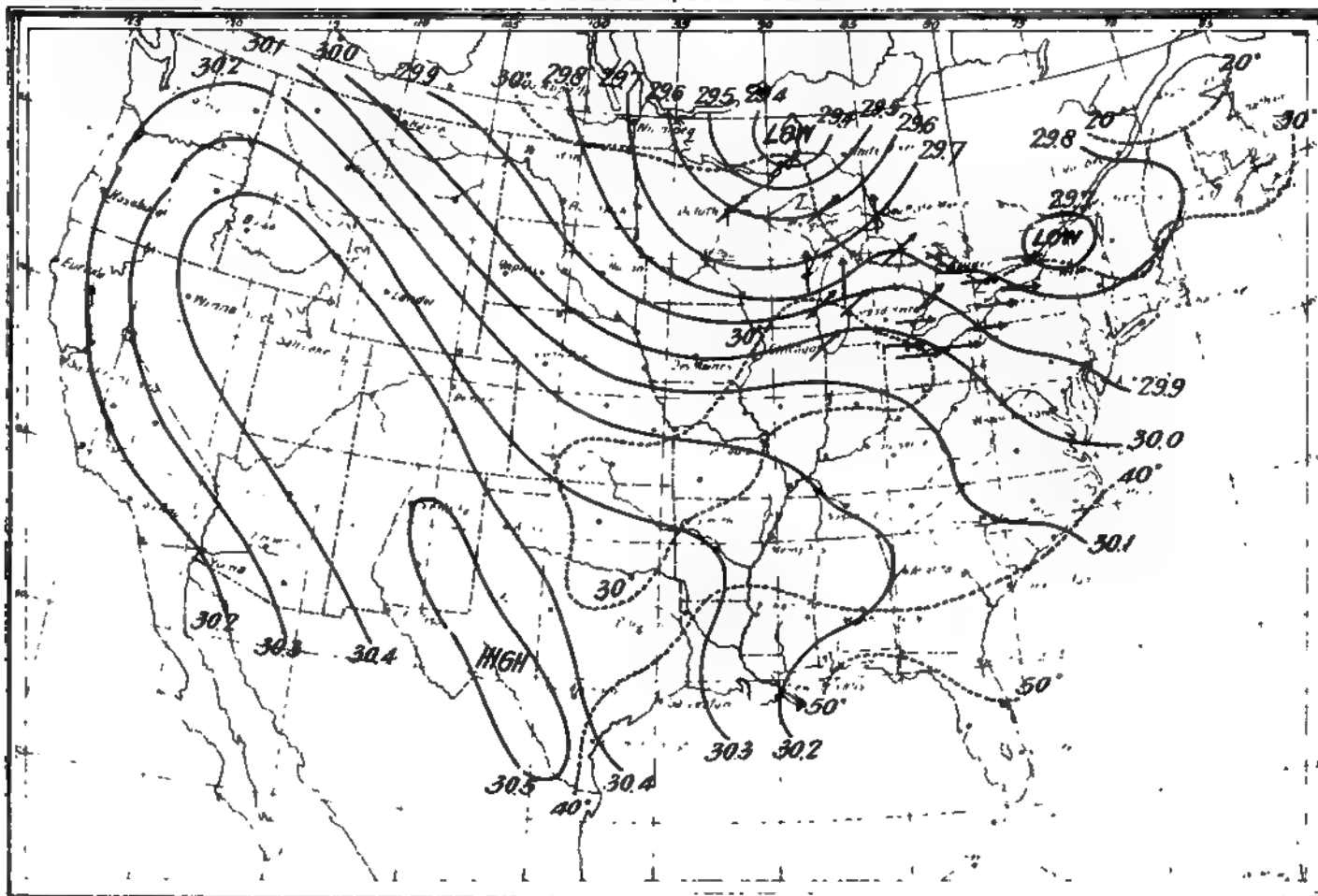


Chart DOOOXOVIII.

December 4, 1898—8 p. m.

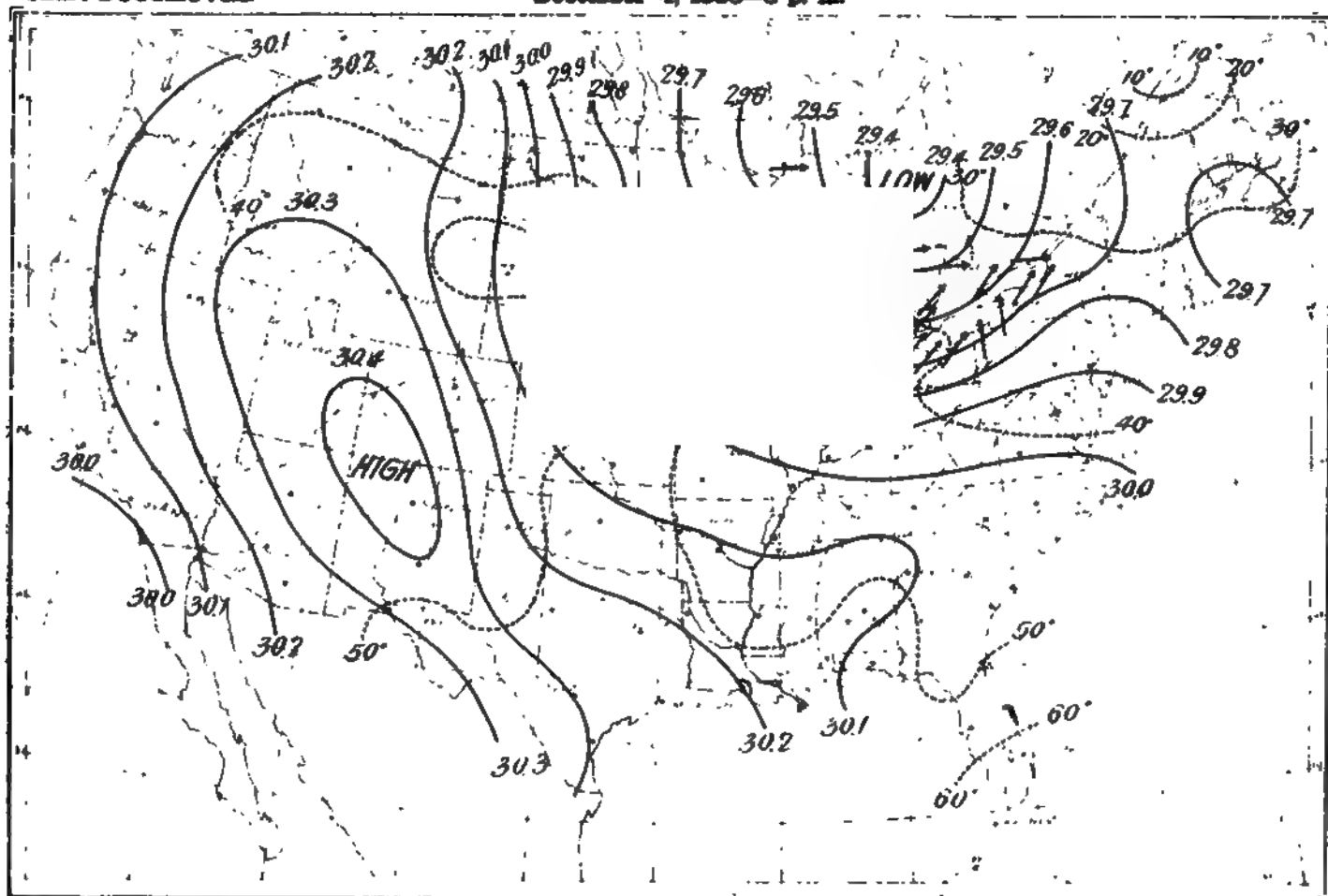


Chart D0000IX.

December 5, 1888—8 a. m.

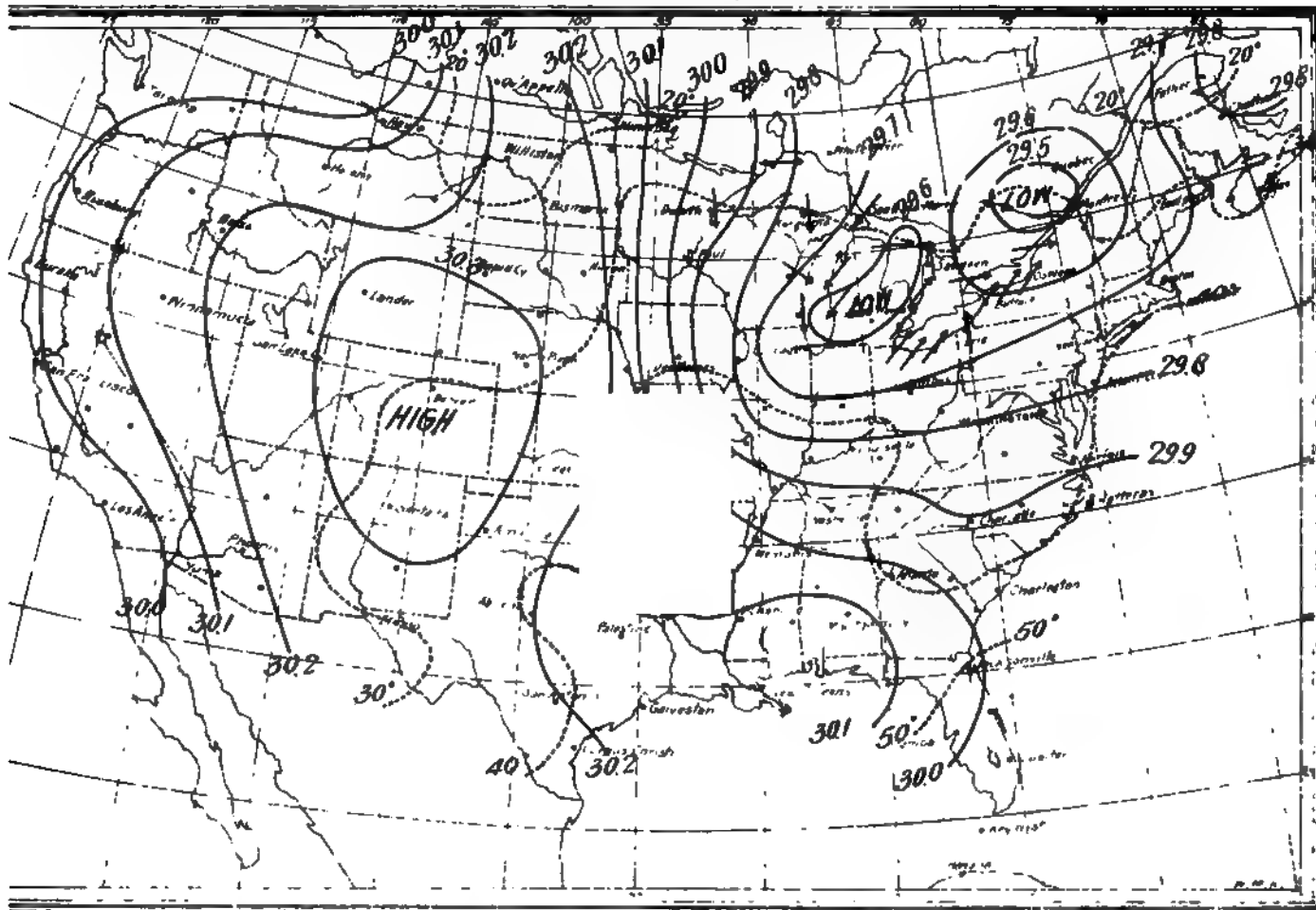


Chart D0000.

December 5, 1888—8 p. m.

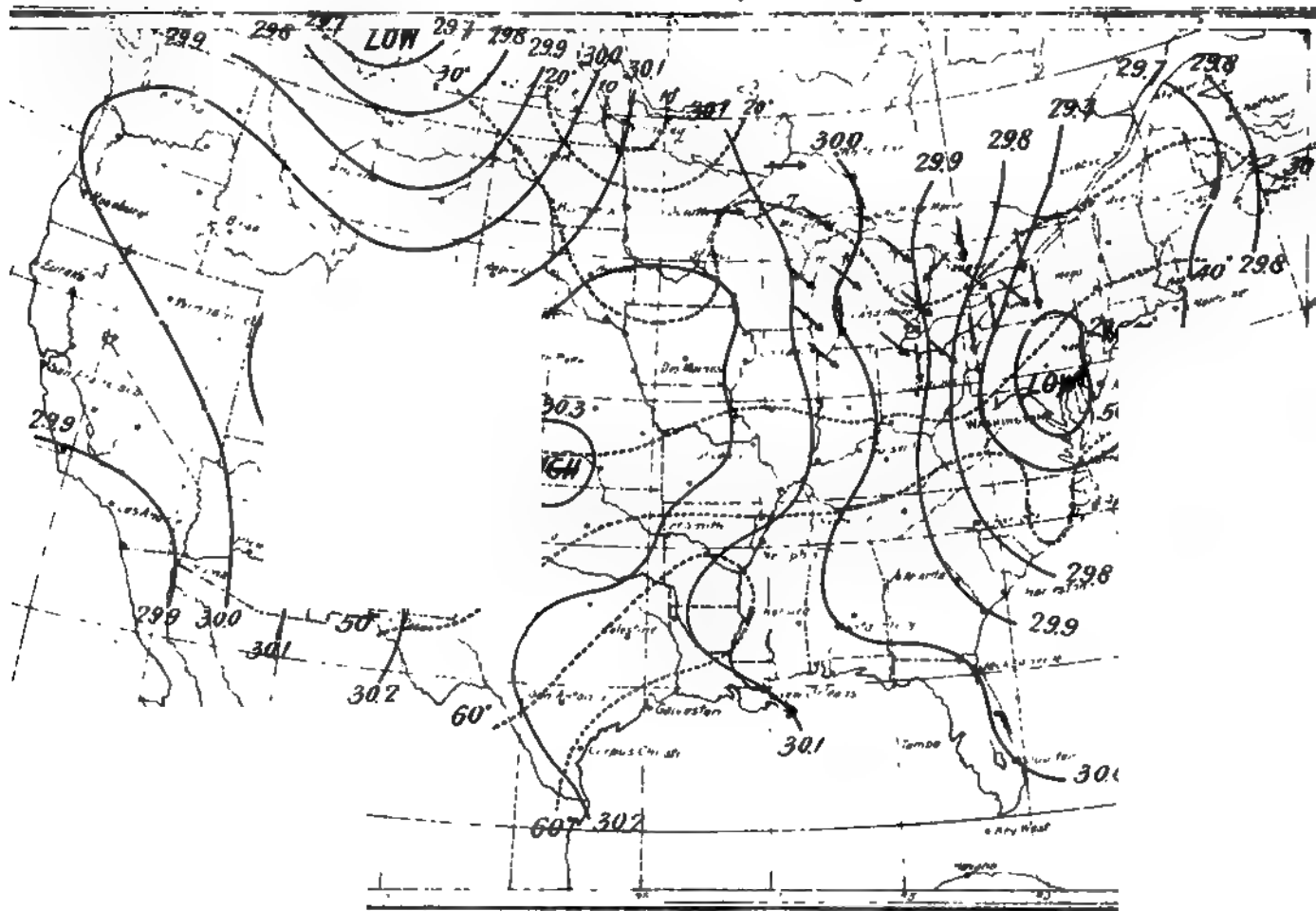


Chart D00001

December 24, 1889—8 a. m.

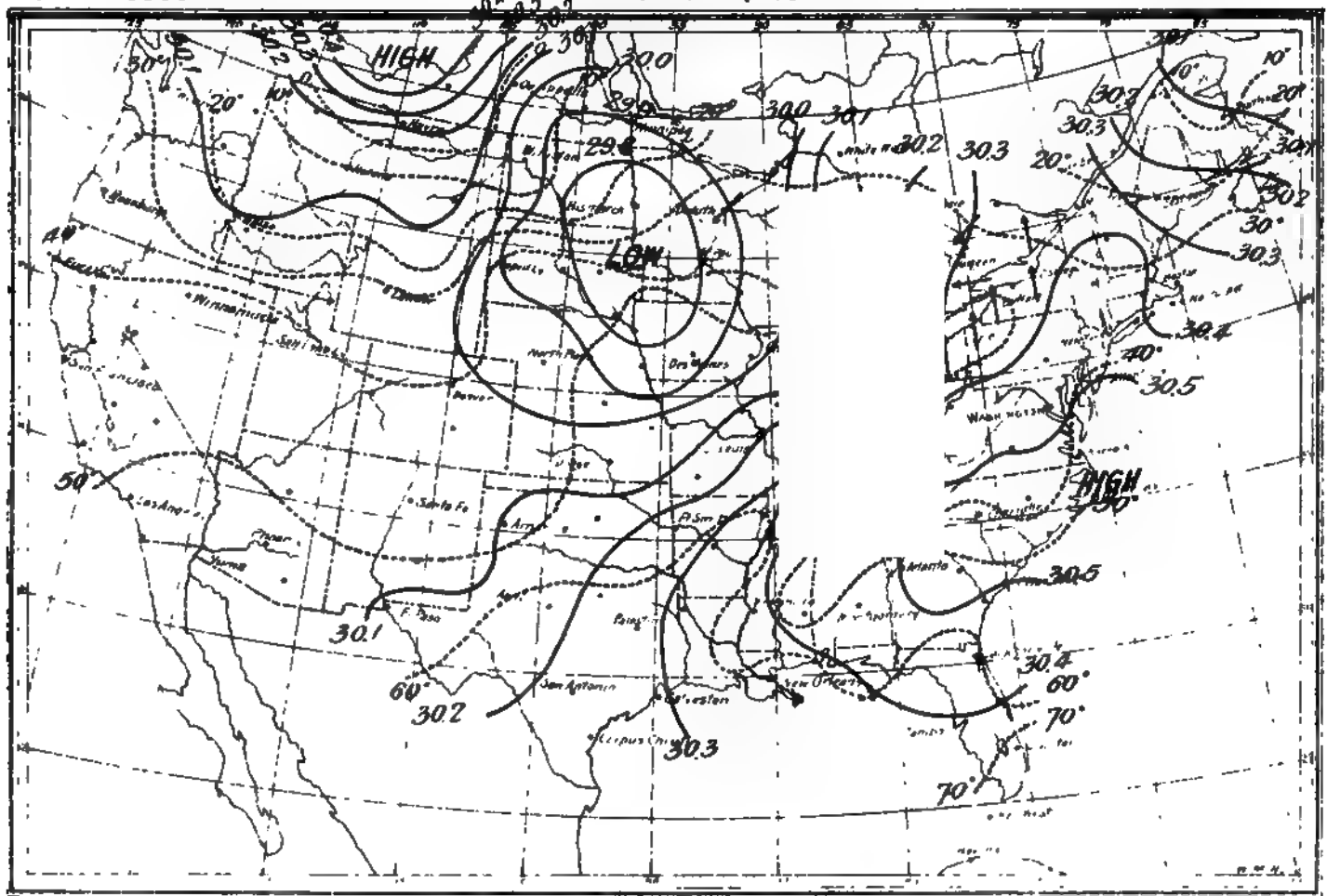


Chart D00001

December 24, 1889—8 p. m.

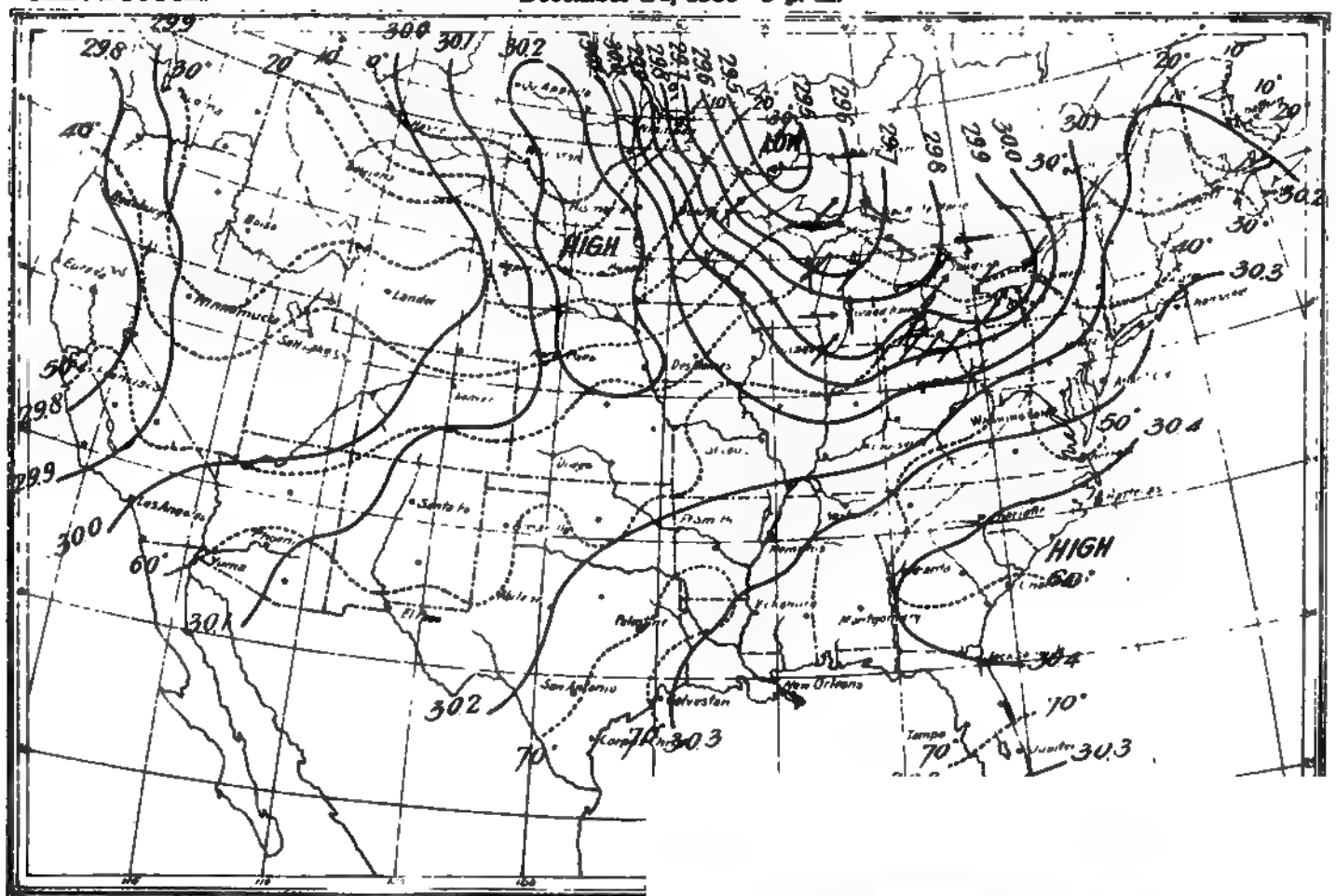




Chart D0000V.

December 10, 1890—8 a. m.

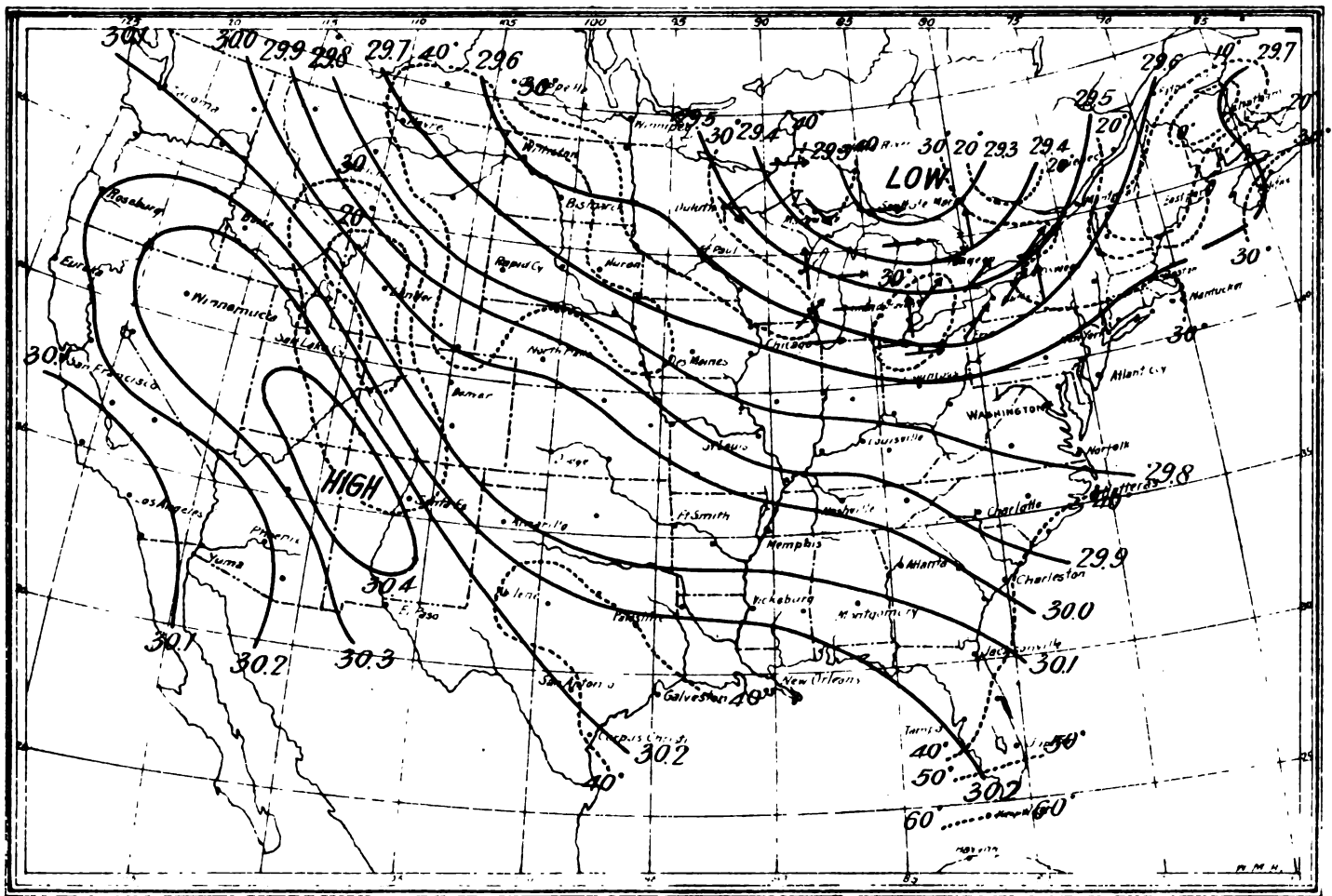


Chart D0000VI.

December 10, 1890—8 p. m.

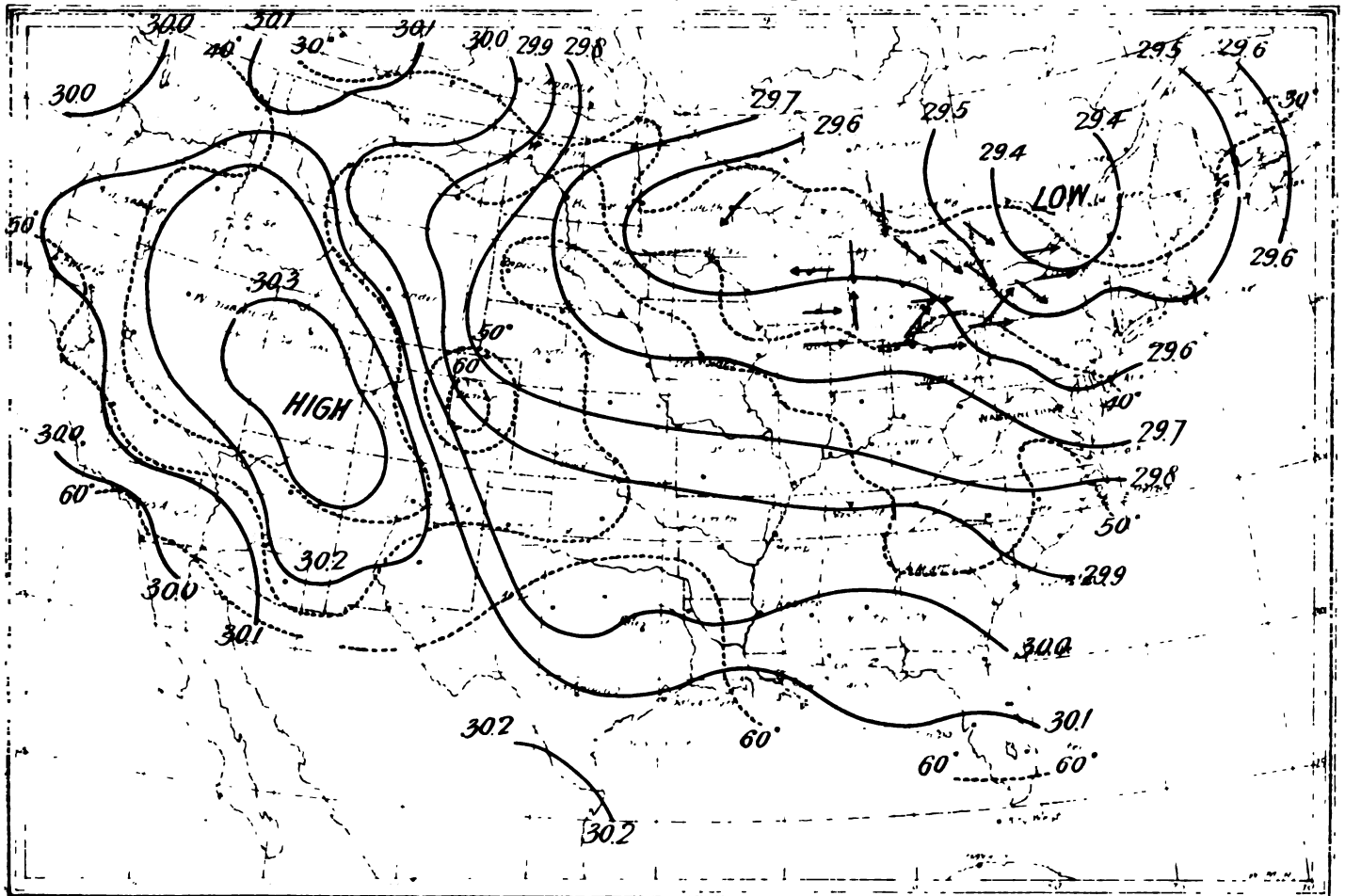


Chart D0000IX.

December 27, 1890—8 p. m.

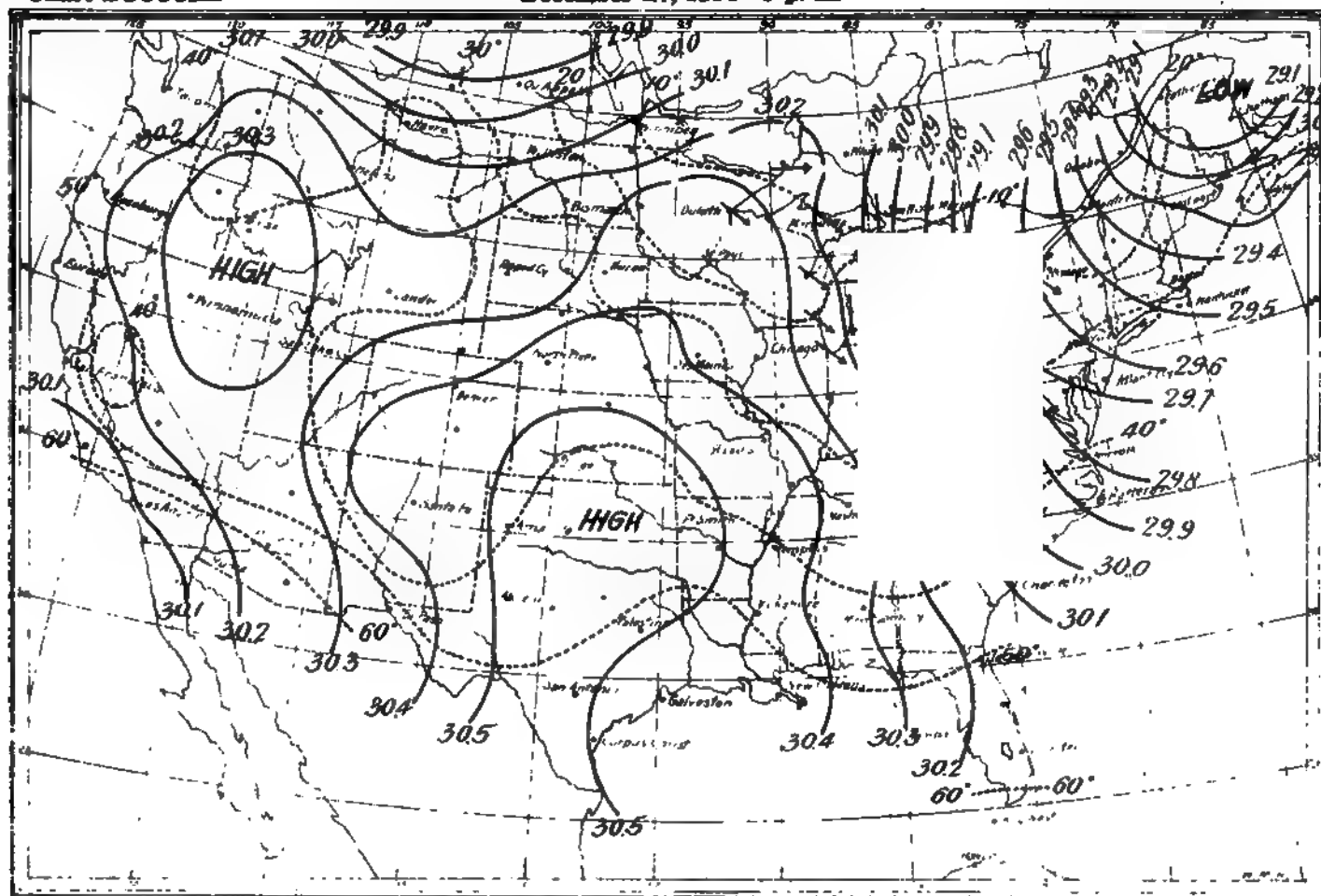
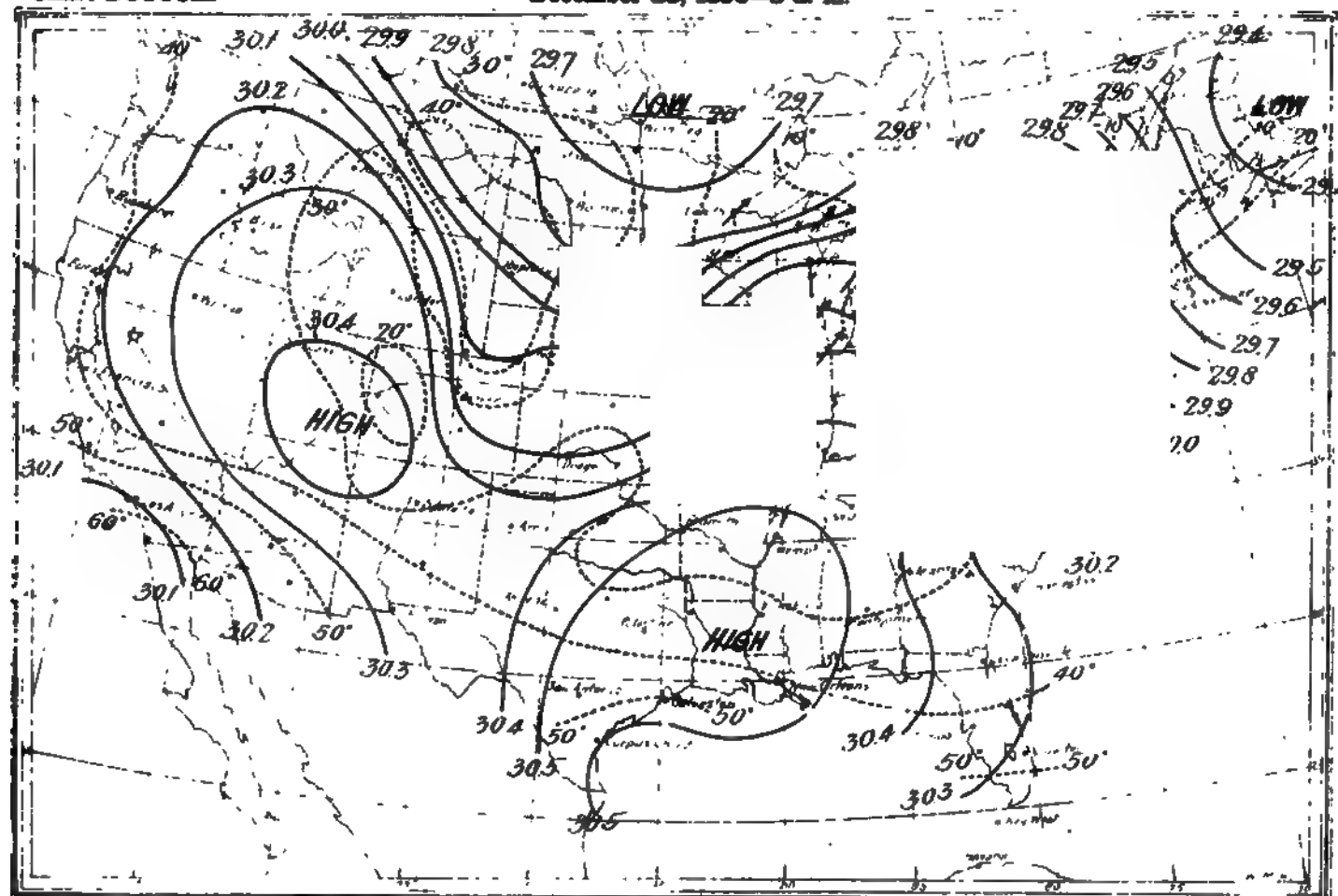
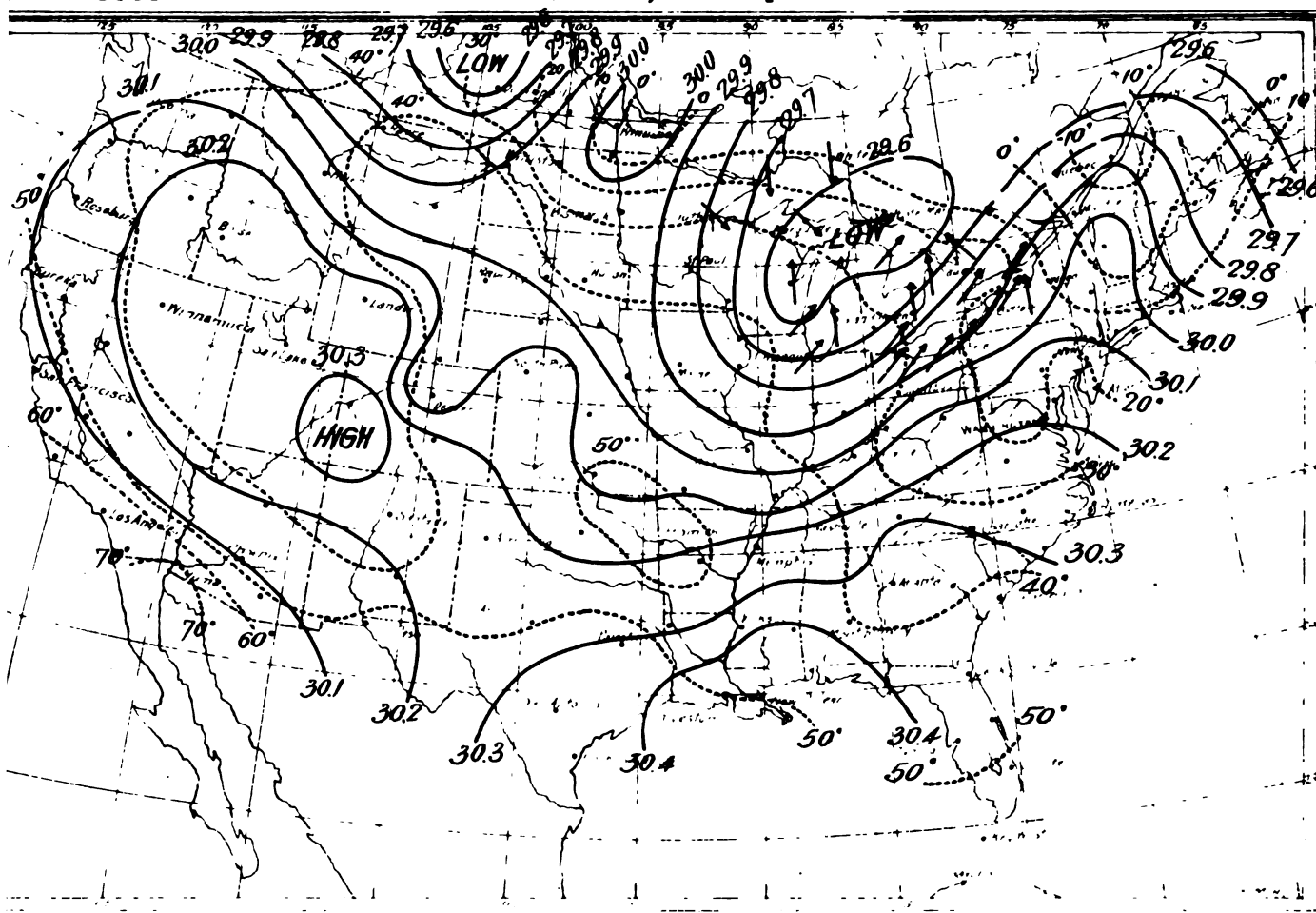


Chart D0000IX.

December 28, 1890—8 a. m.



December 28, 1890—8 p. m.



December 29, 1890—8 a. m.

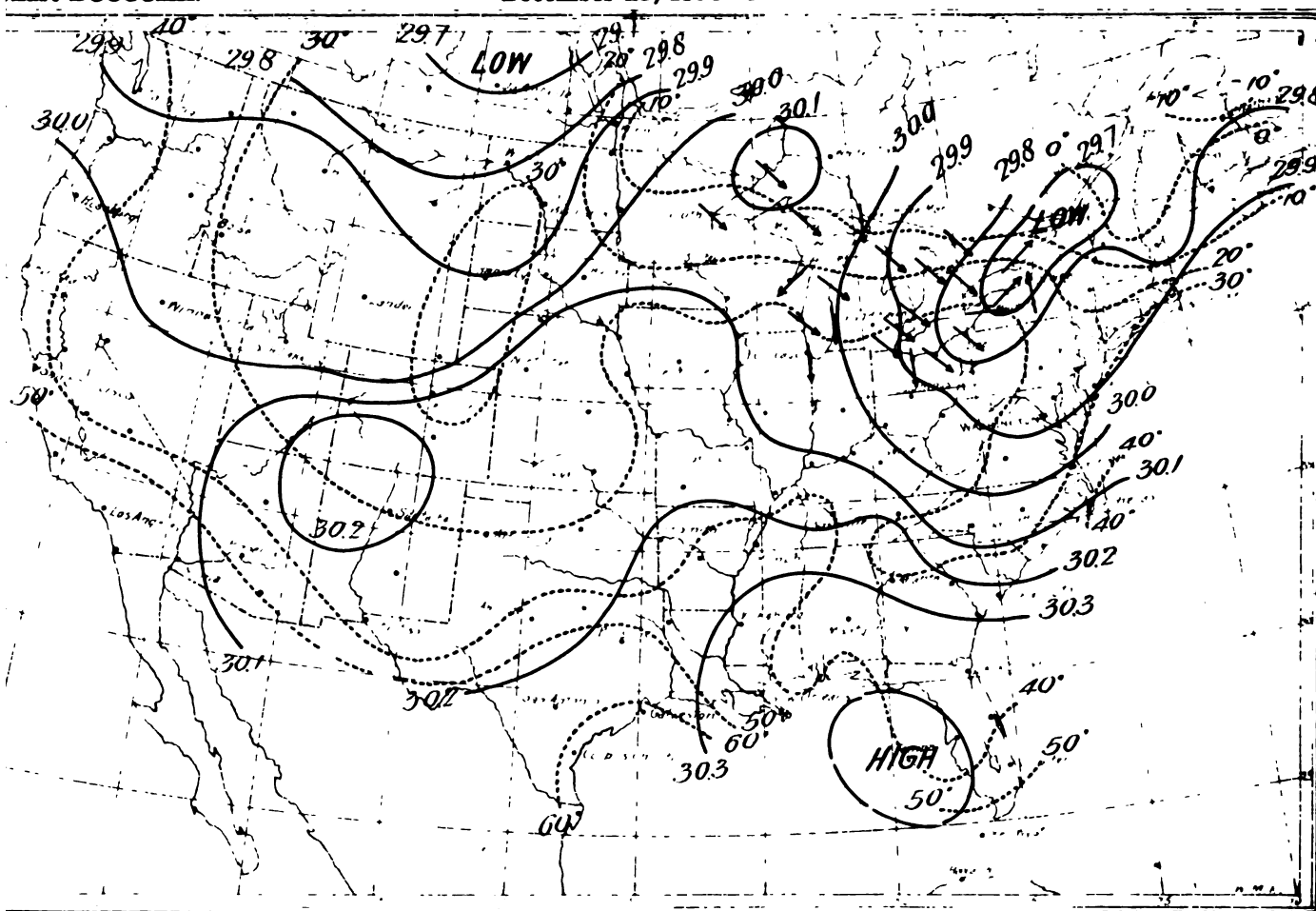


Chart DCCCCXIII.

December 3, 1891—8 a. m.

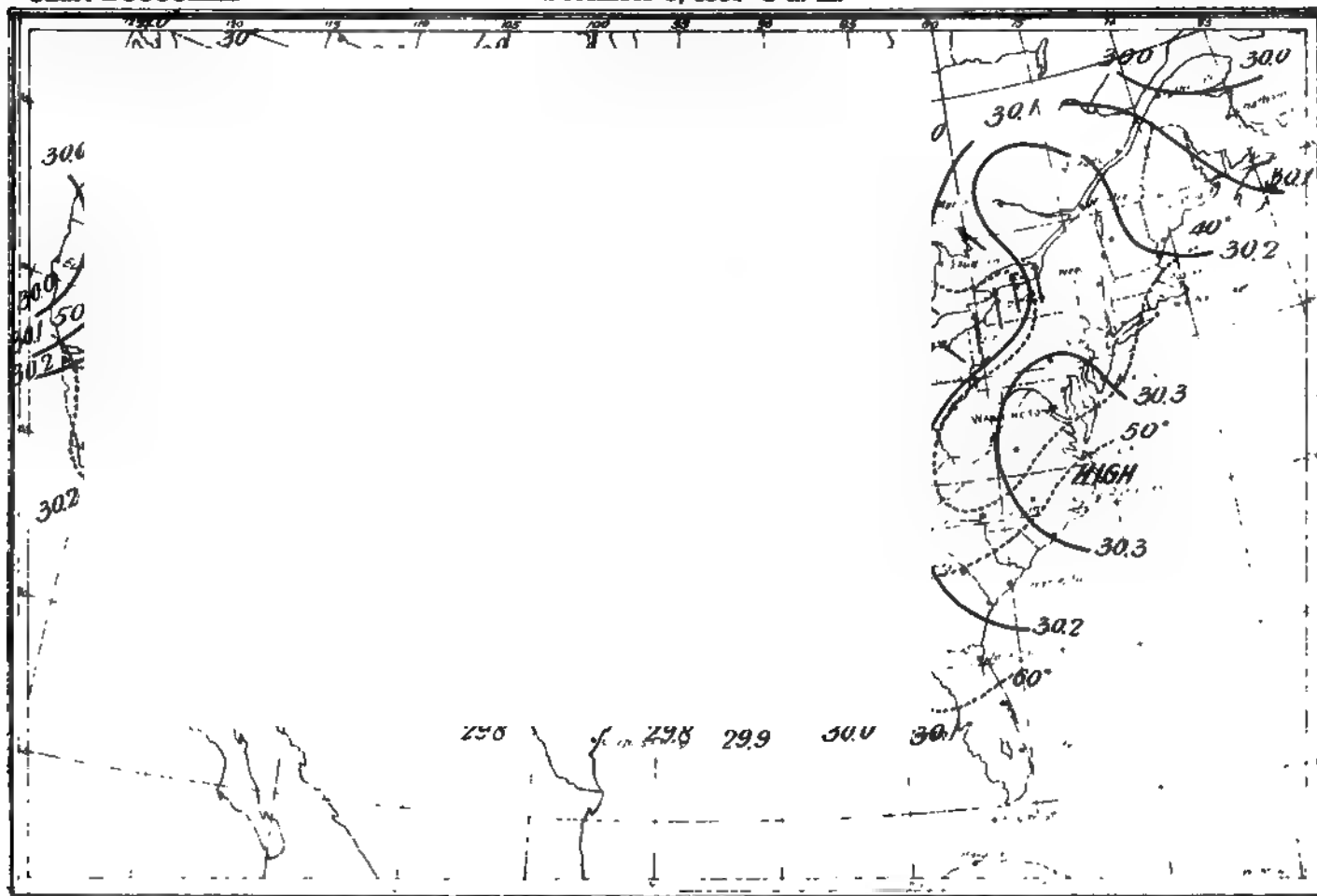


Chart DCCCCXIV.

December 3, 1891—8 p. m.

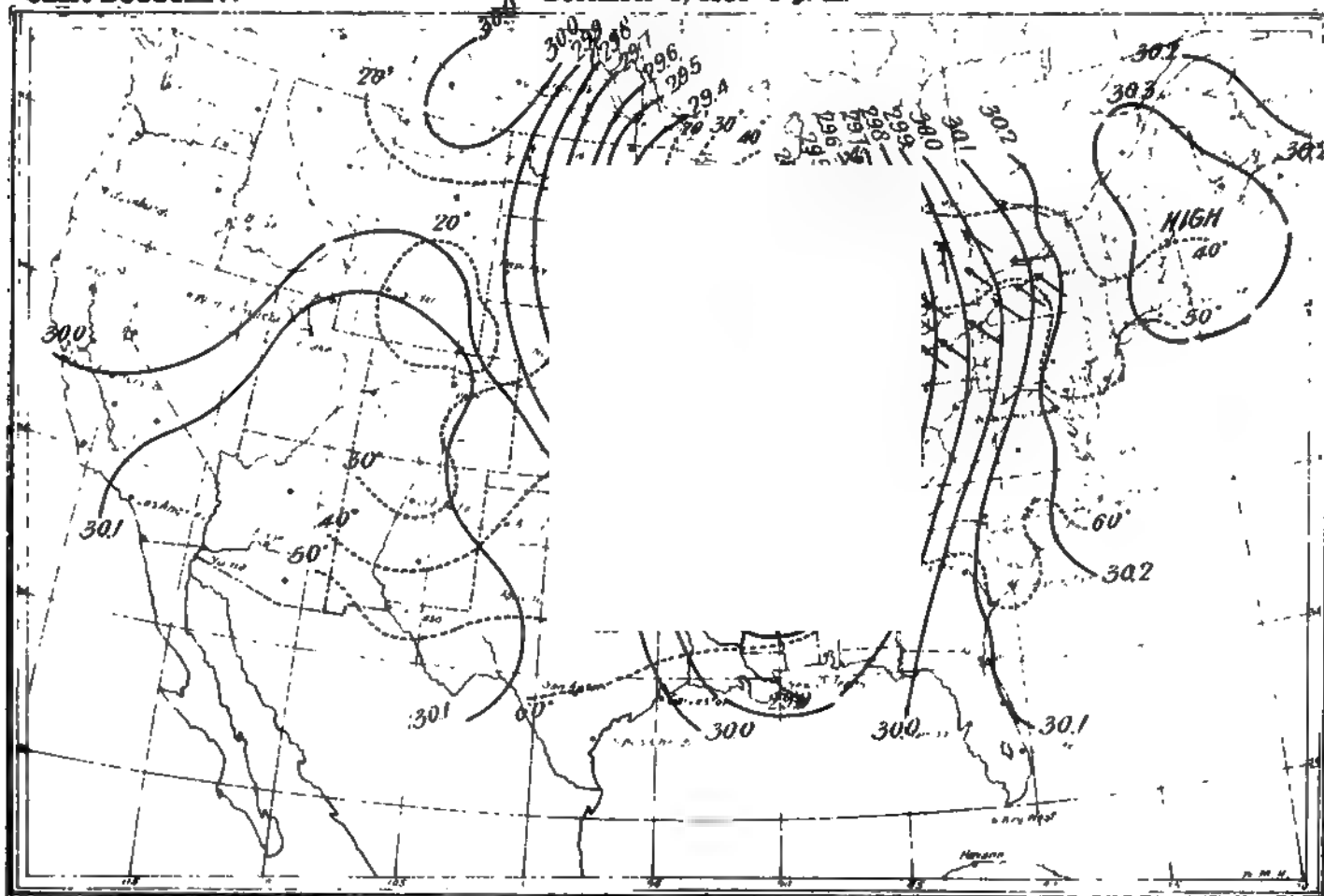


Chart D0000XV.

December 4, 1891—8 a. m.

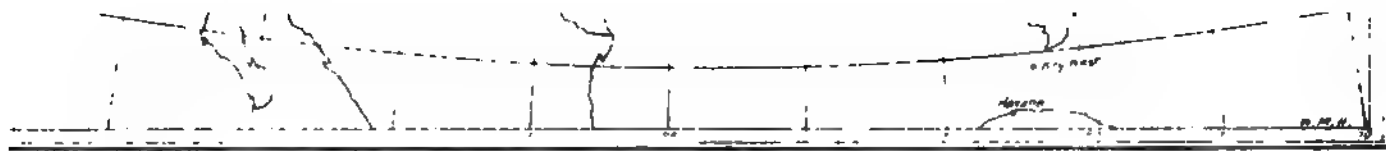


Chart D0000XVI.

December 4, 1891—8 a. m.

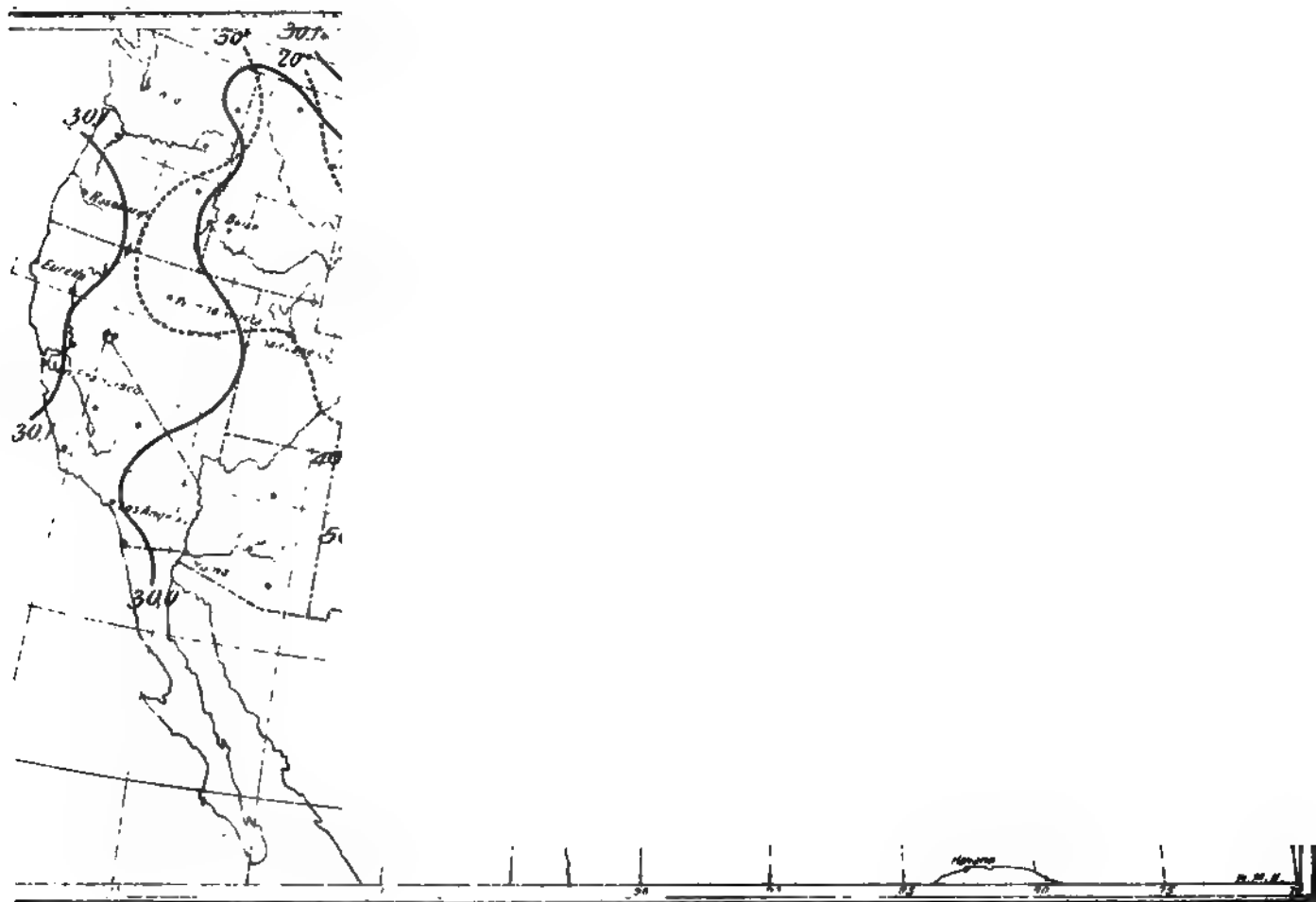


Chart D0000XVII.

December 7, 1892—8 a. m.

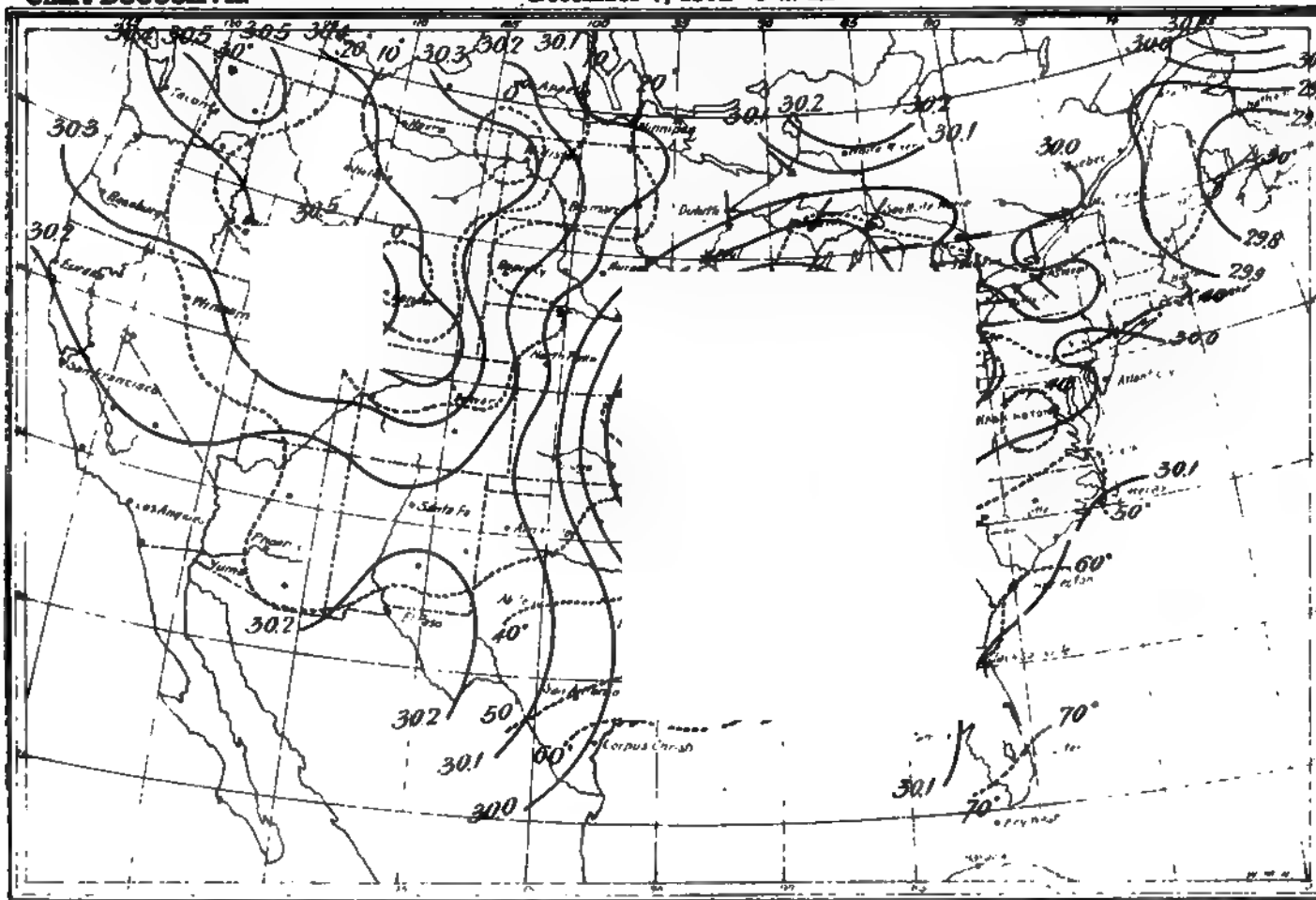


Chart D0000XVIII.

December 7, 1892—8 p. m.

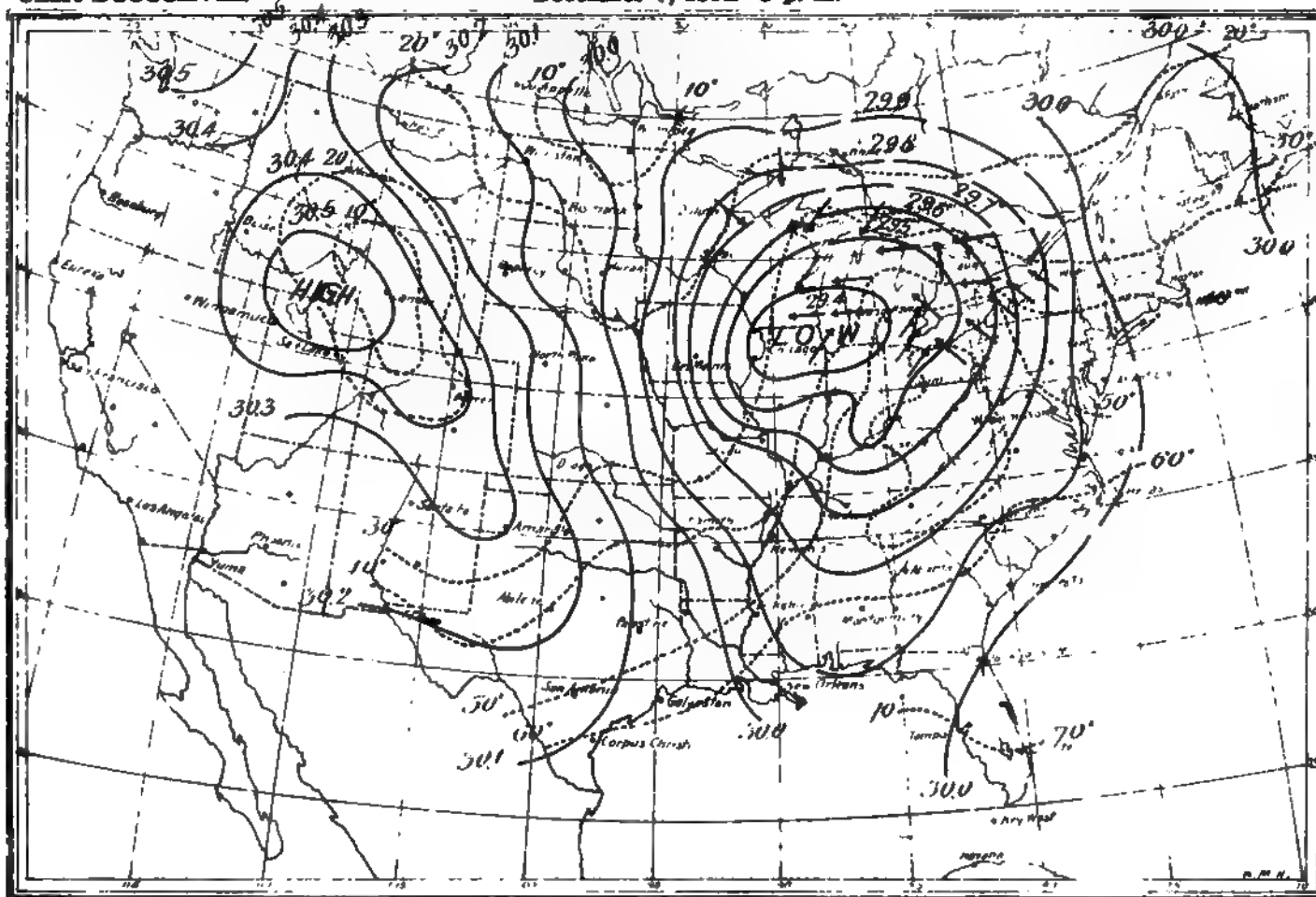


Chart D0000XIX.

December 8, 1892—8 a. m.

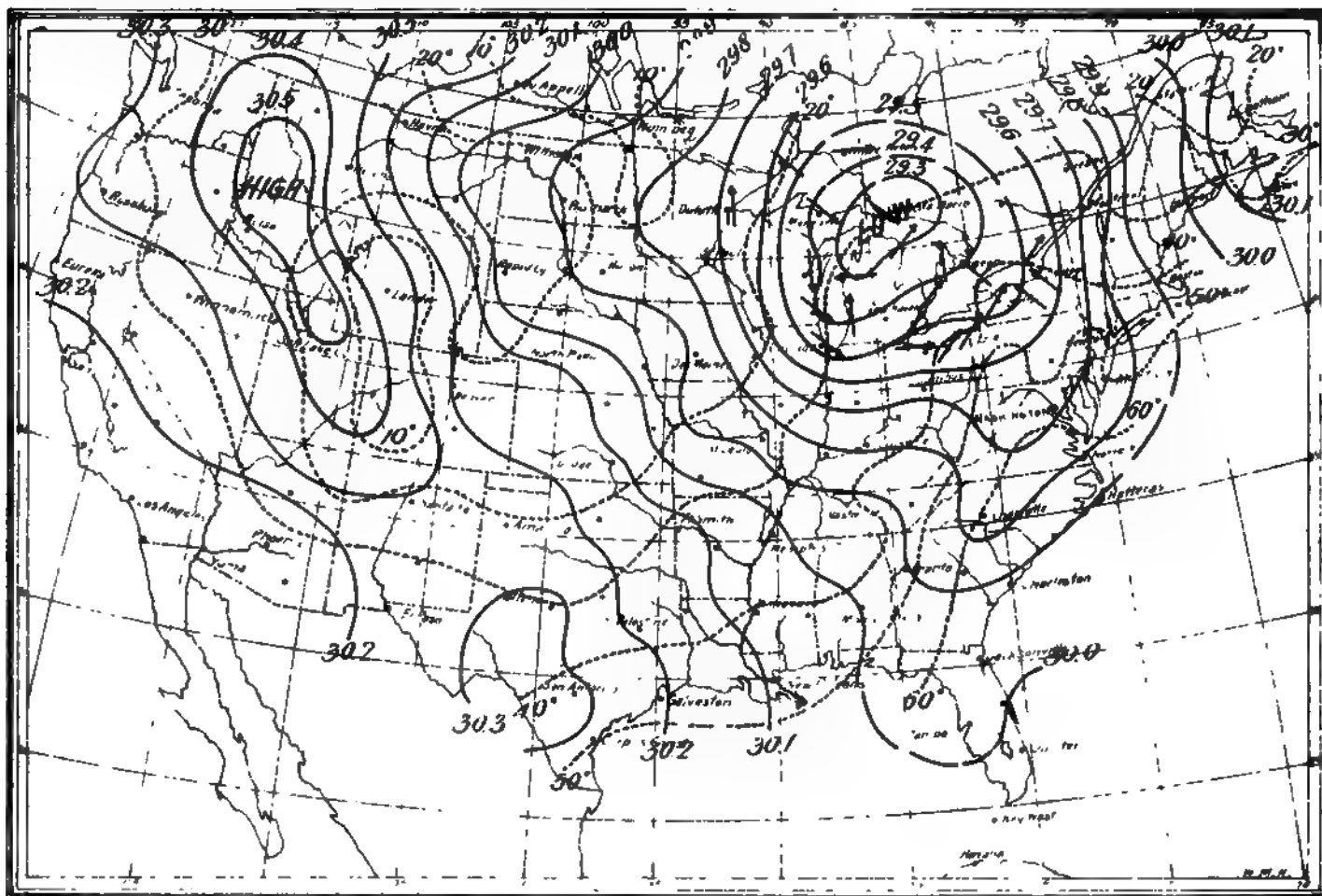


Chart D0000XX.

December 8, 1892—8 p. m.

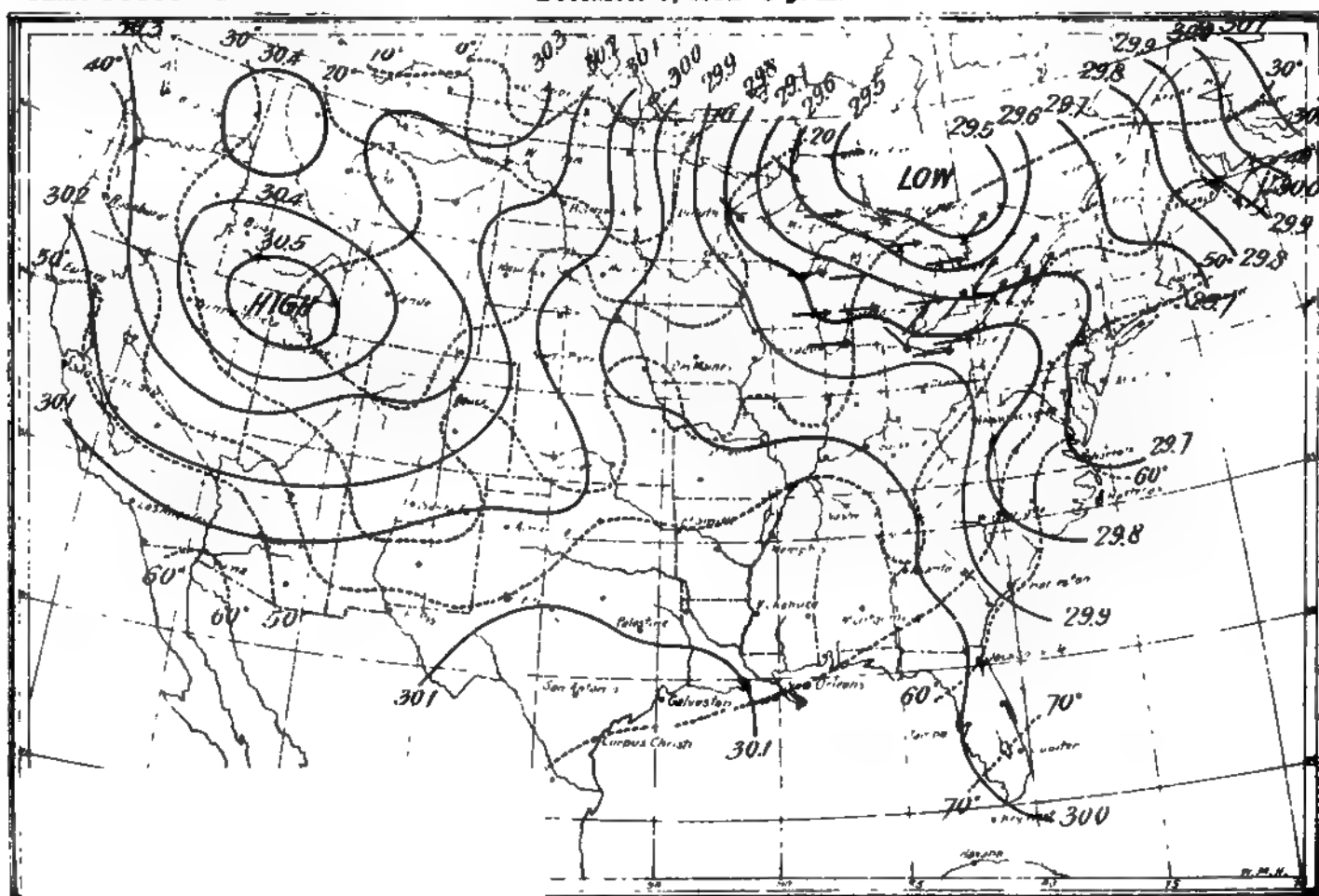


Chart D0000XXI.

December 12, 1892—8 a. m.

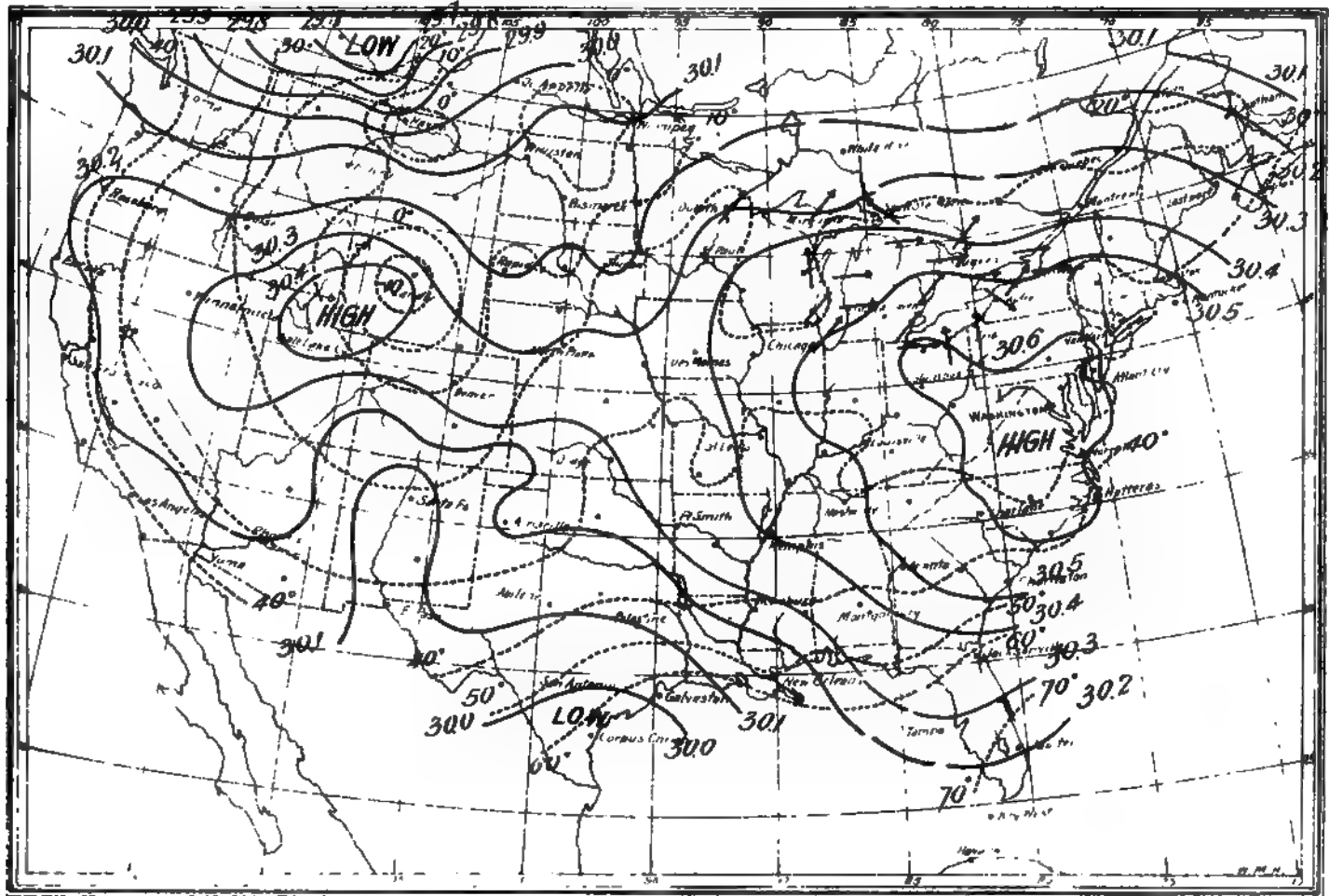


Chart D0000XXII.

December 12, 1892—8 p. m.

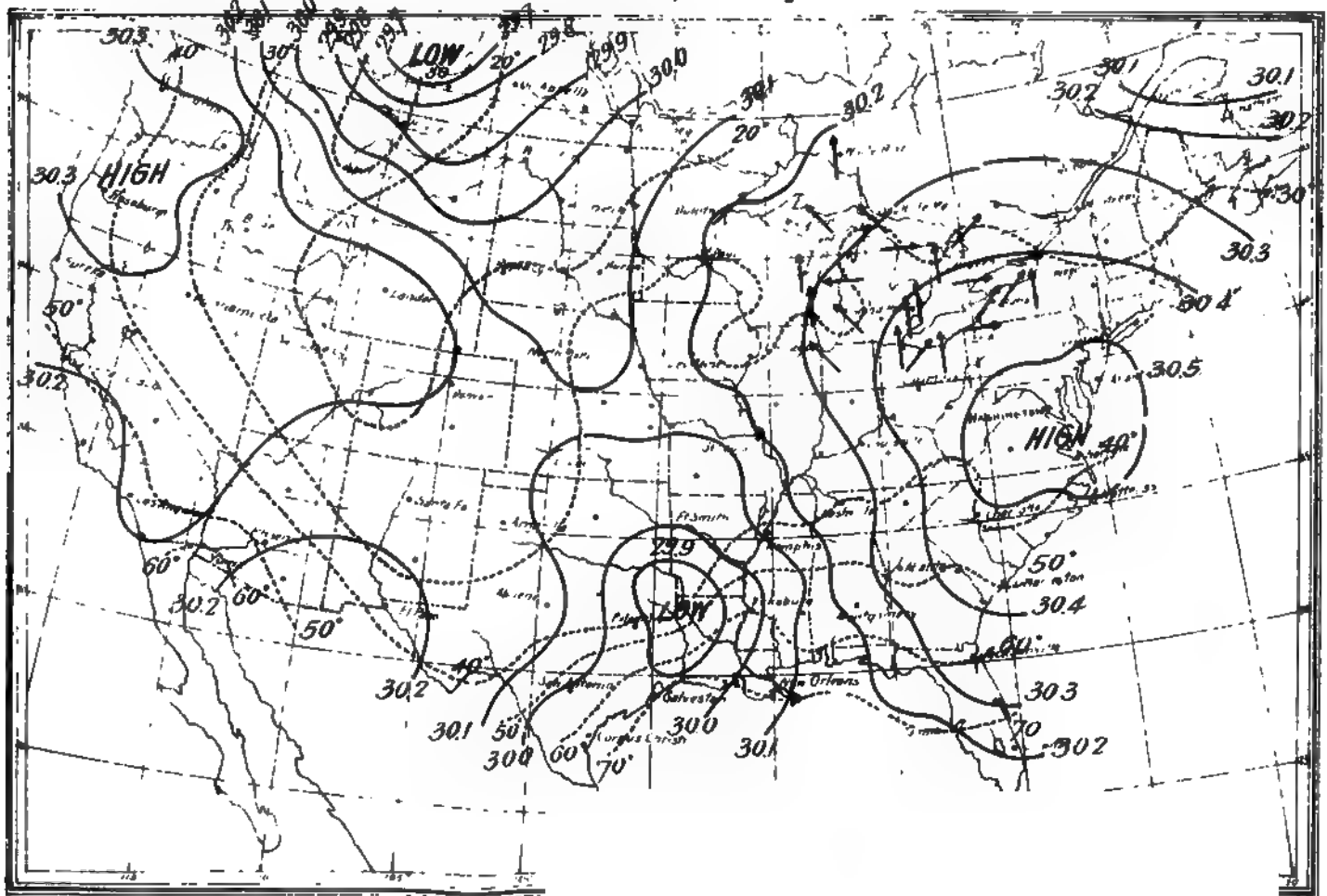


Chart DCCCCXIII.

December 13, 1892—8 a. m.

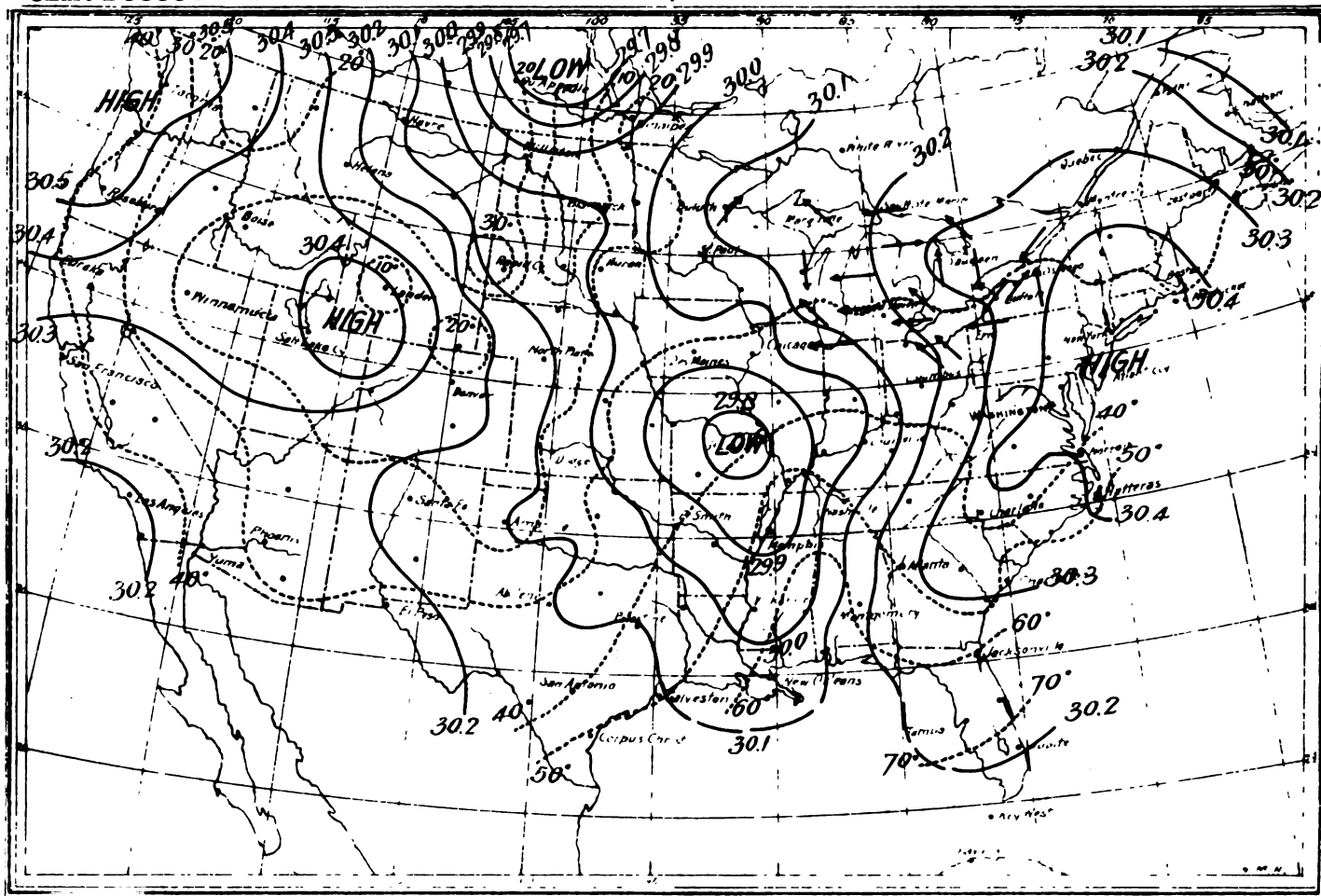


Chart DCCCCXIV.

December 13, 1892—8 p. m.

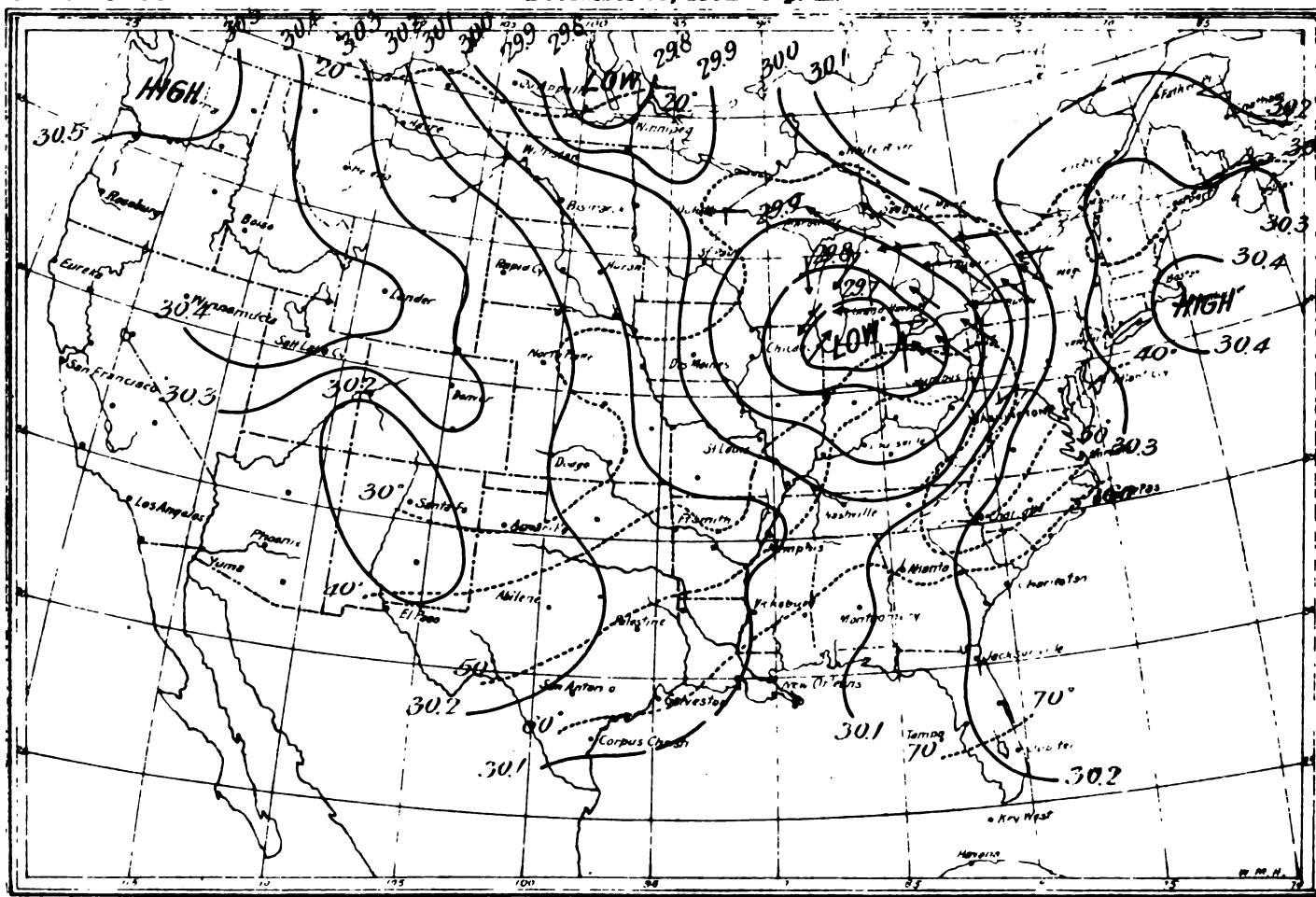


Chart D0000XXV.

December 14, 1898—8 a. m.

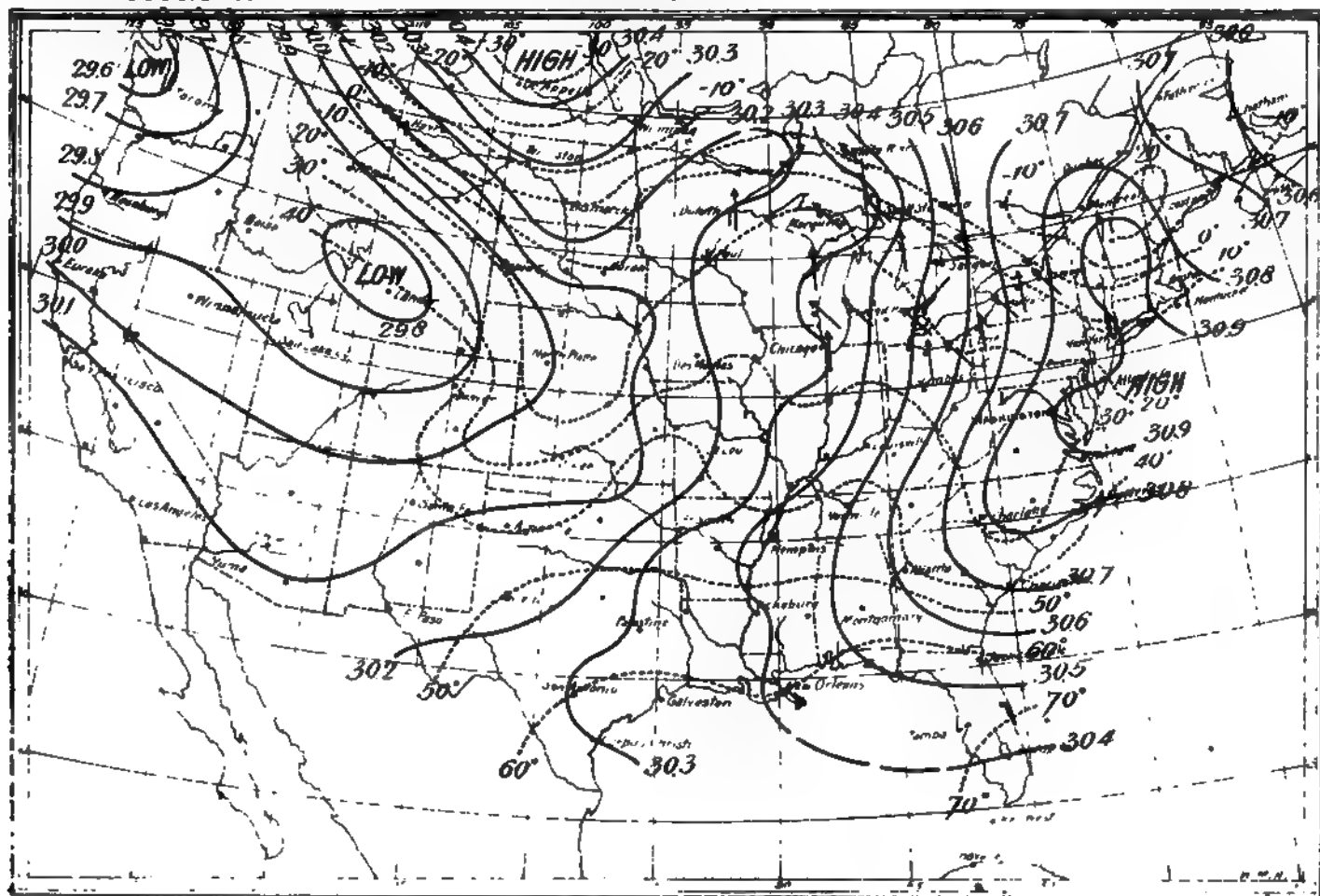


Chart D0000XXVI.

December 14, 1898—8 p. m.

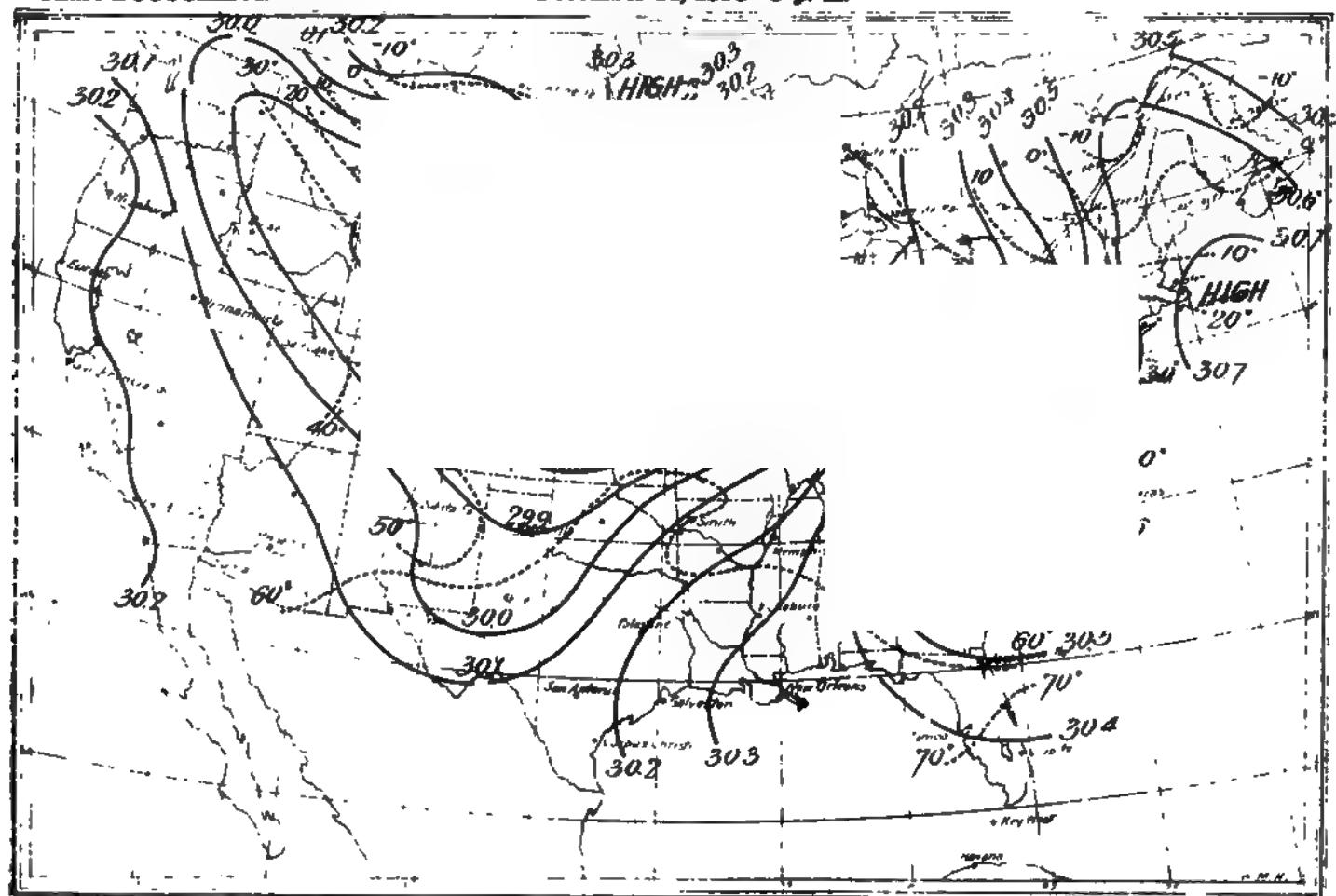


Chart D0000XVII.

December 15, 1898—8 a. m.

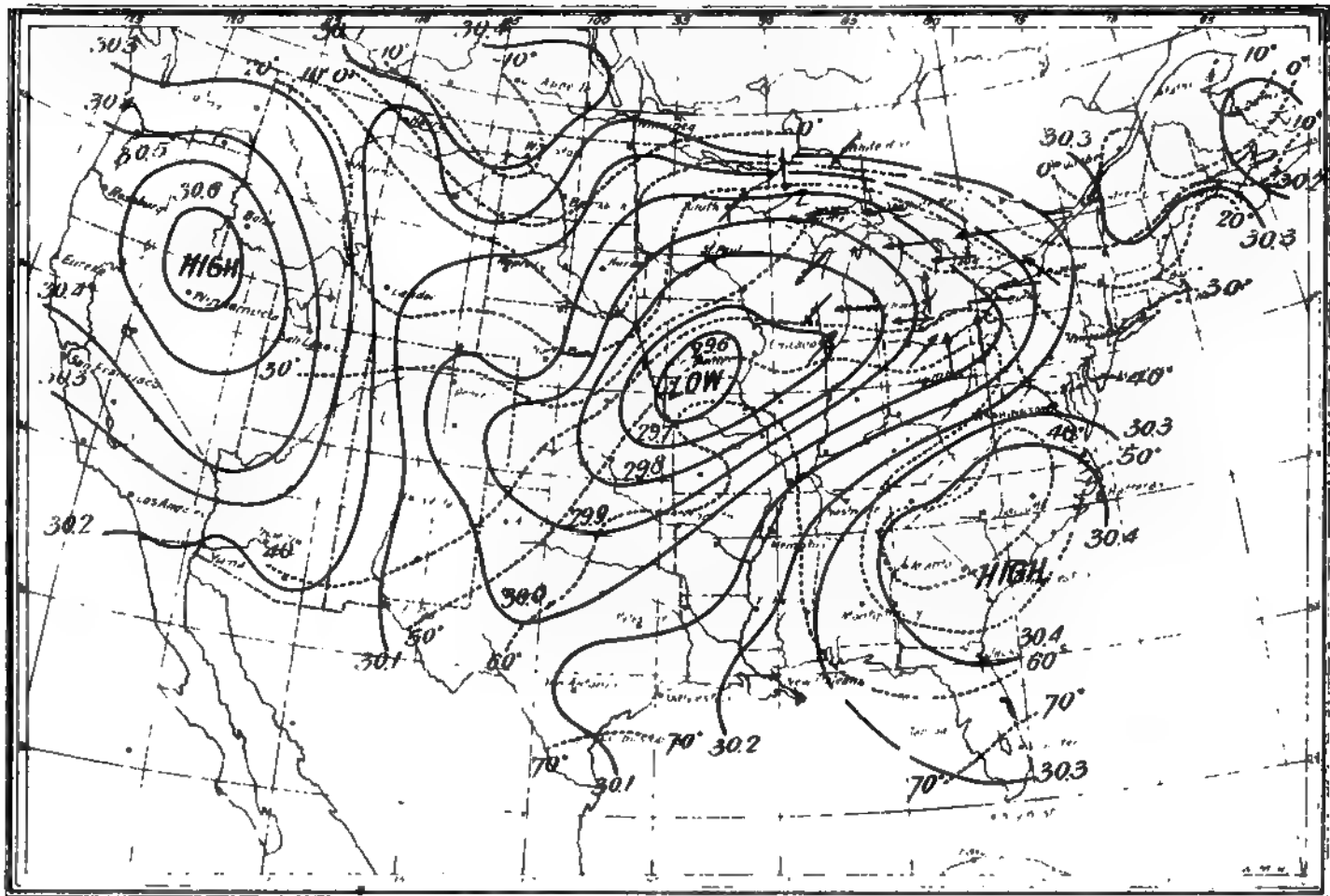


Chart D0000XVIII.

December 15, 1898—8 p. m.

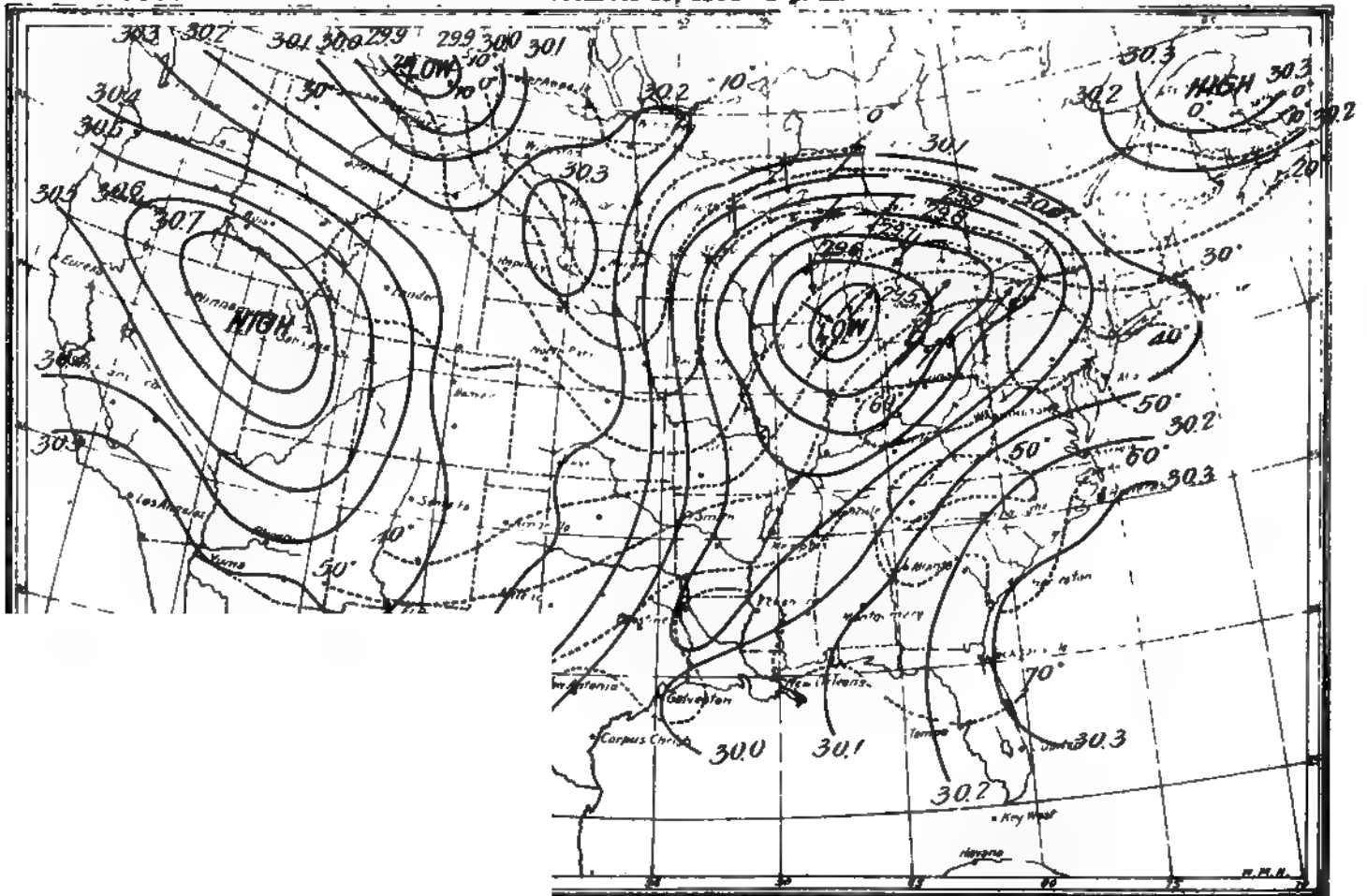


Chart D0000XXIX

December 9, 1894—8 a. m.

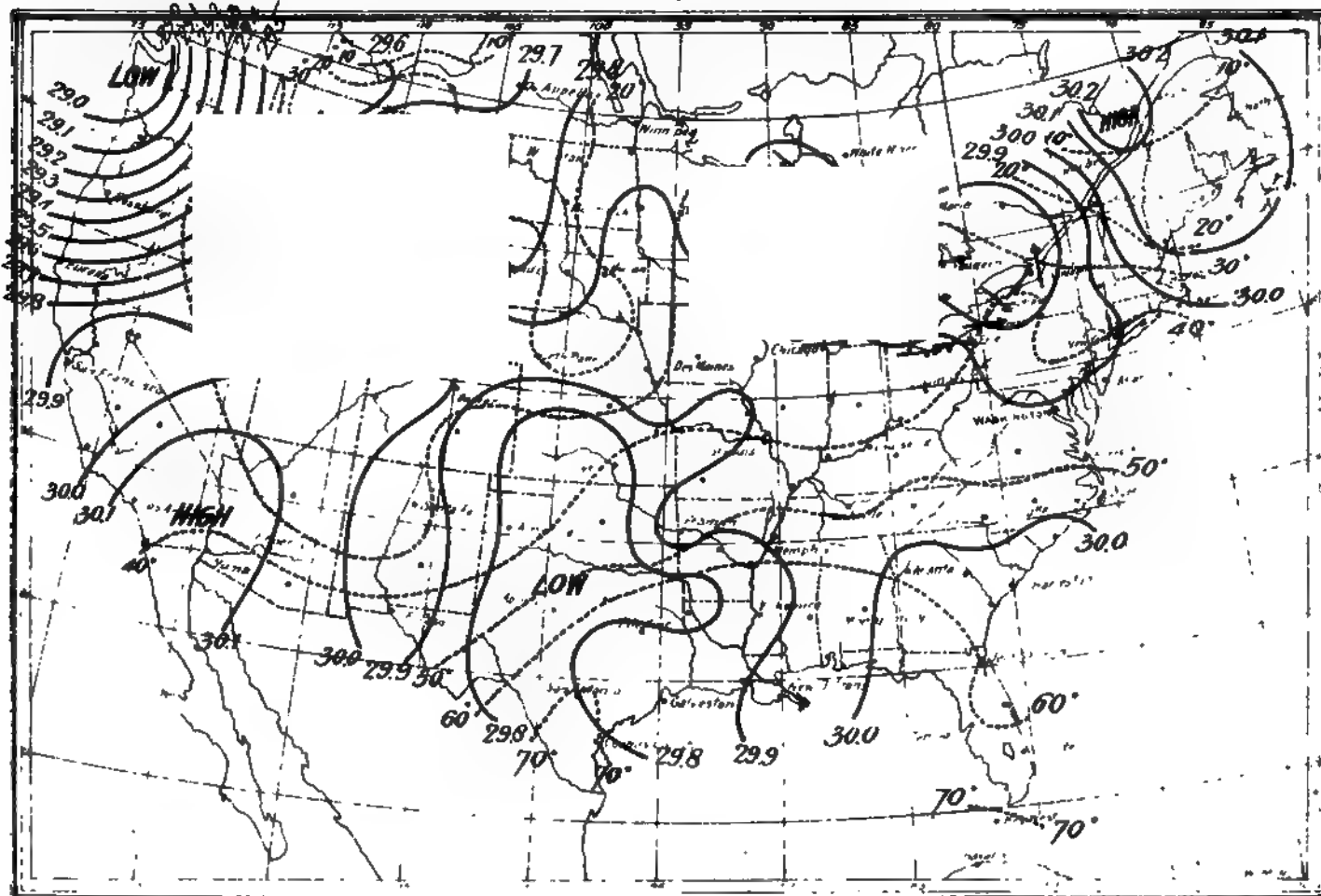


Chart D0000XXX

December 9, 1894—8 p. m.

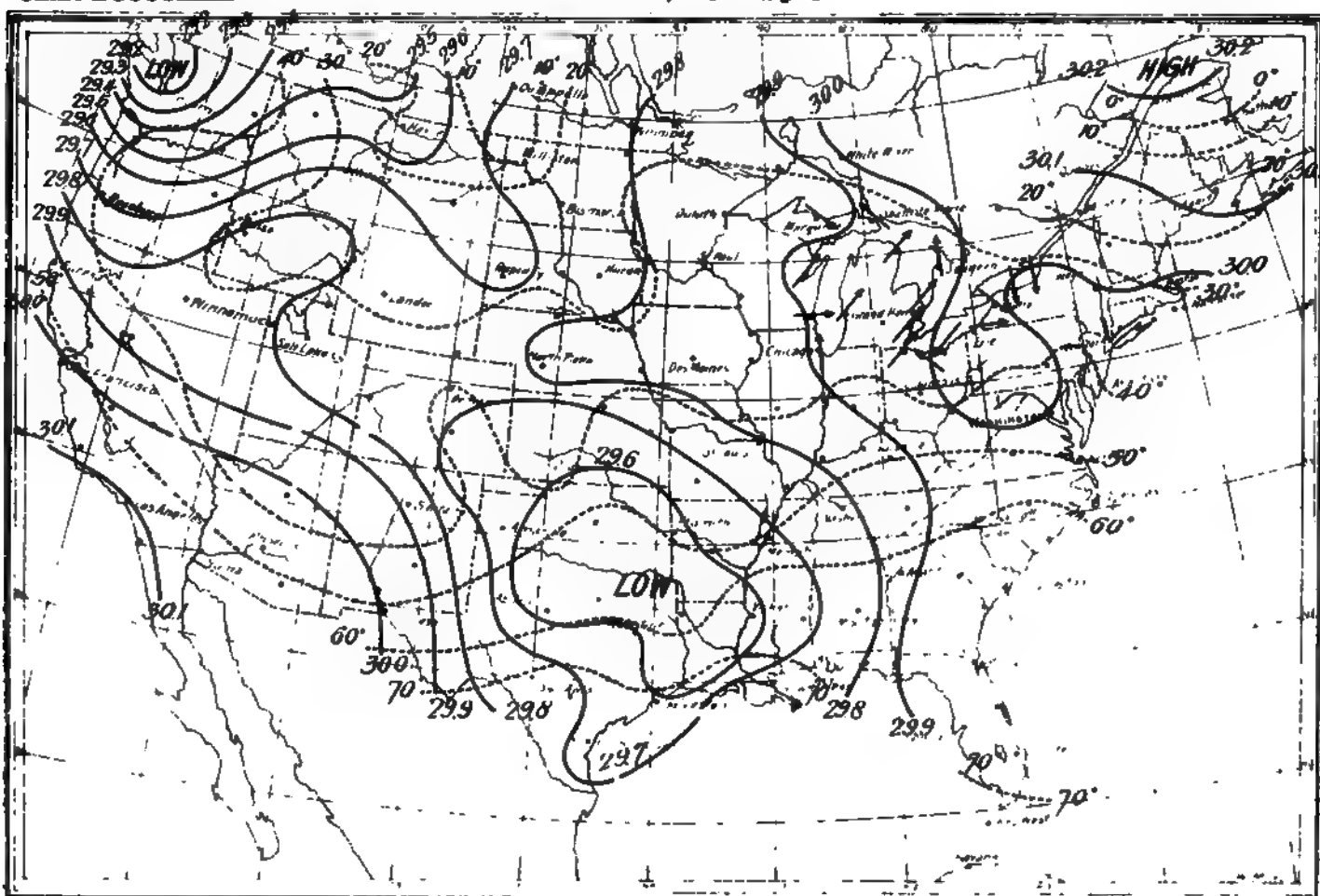


Chart D0000XXXI.

December 10, 1894—8 a. m.

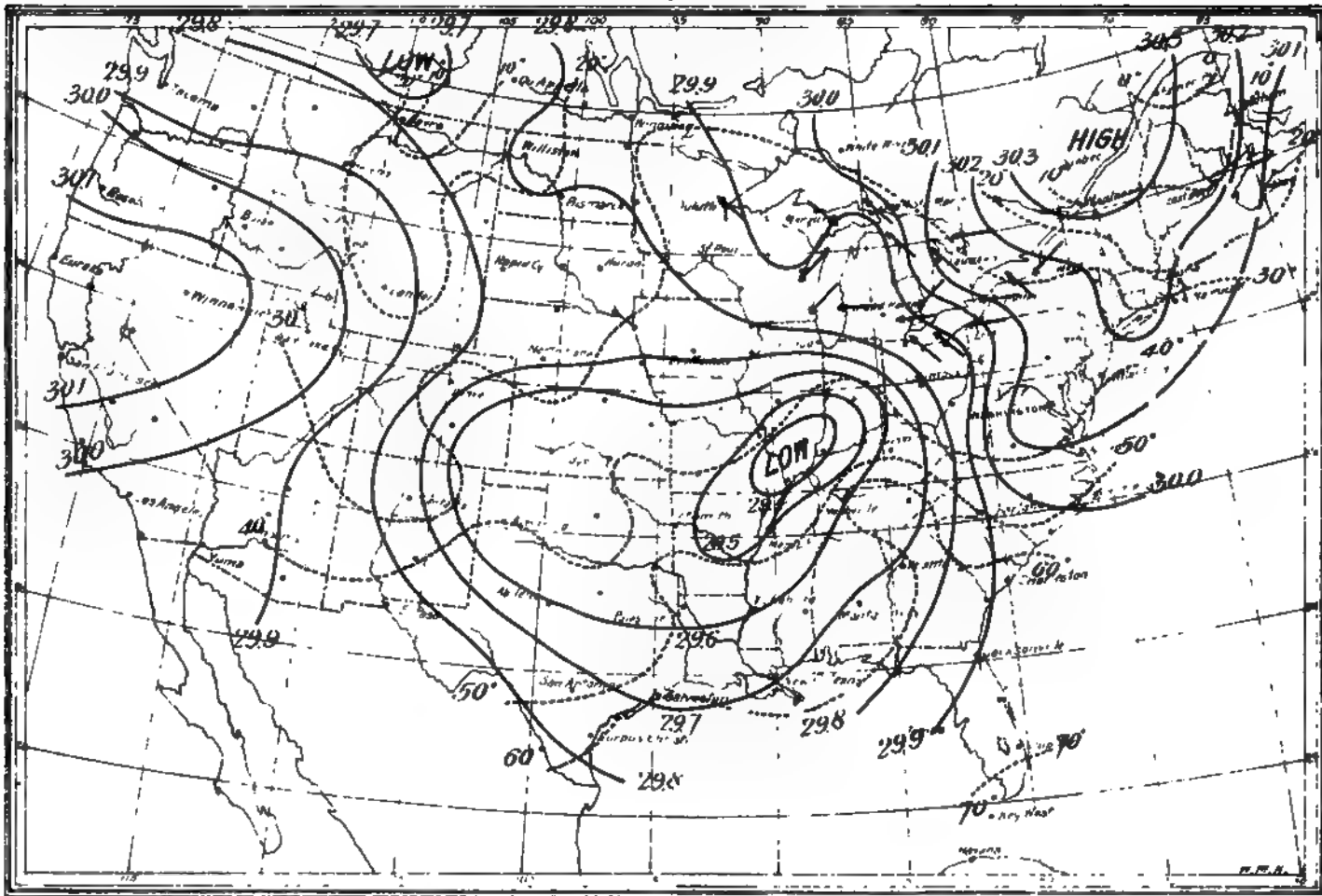


Chart D0000XXXII.

December 10, 1894—8 p. m.

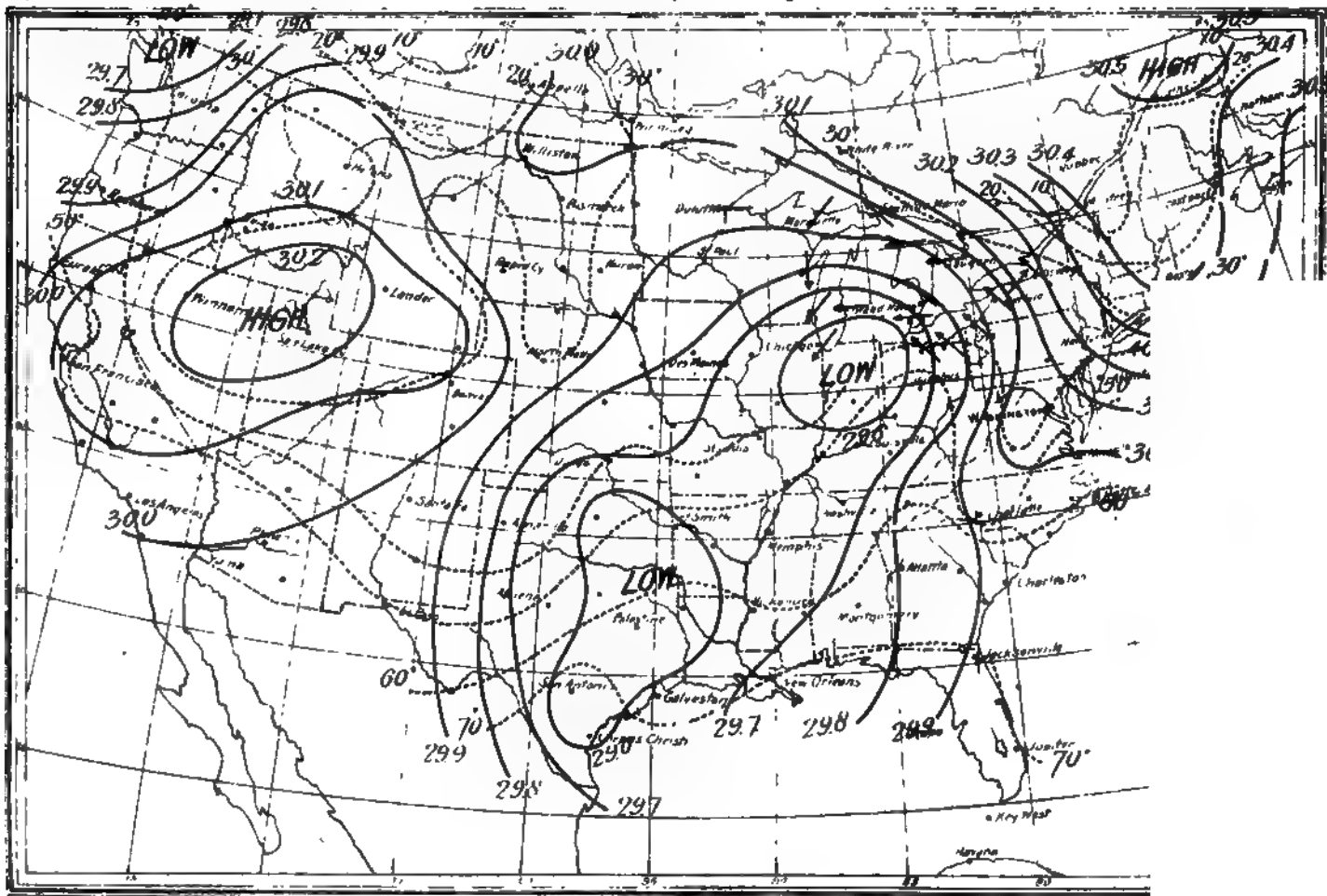


Chart D000000XXXIII.

December 11, 1894—8 a. m.

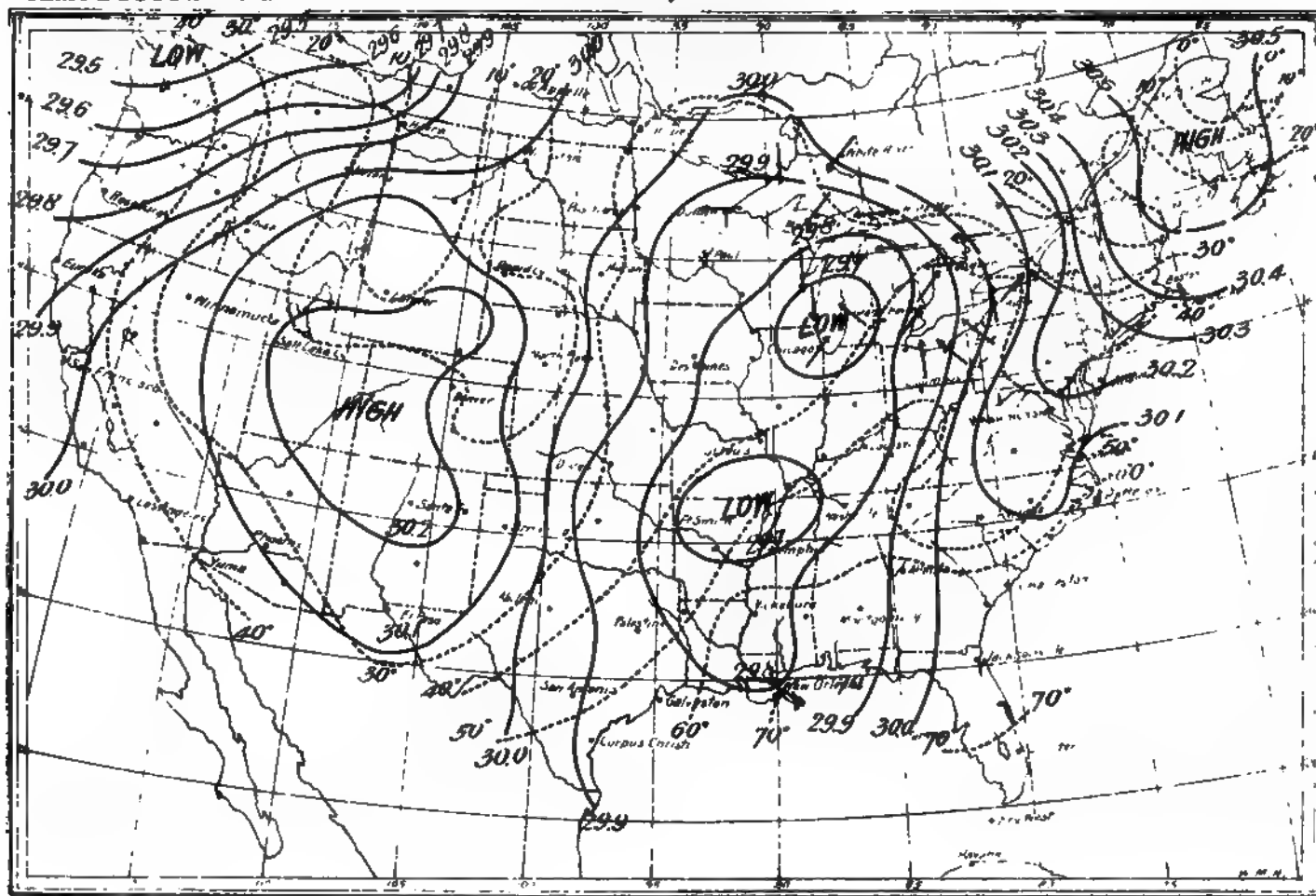


Chart D000000XXXIV.

December 11, 1894—8 p. m.

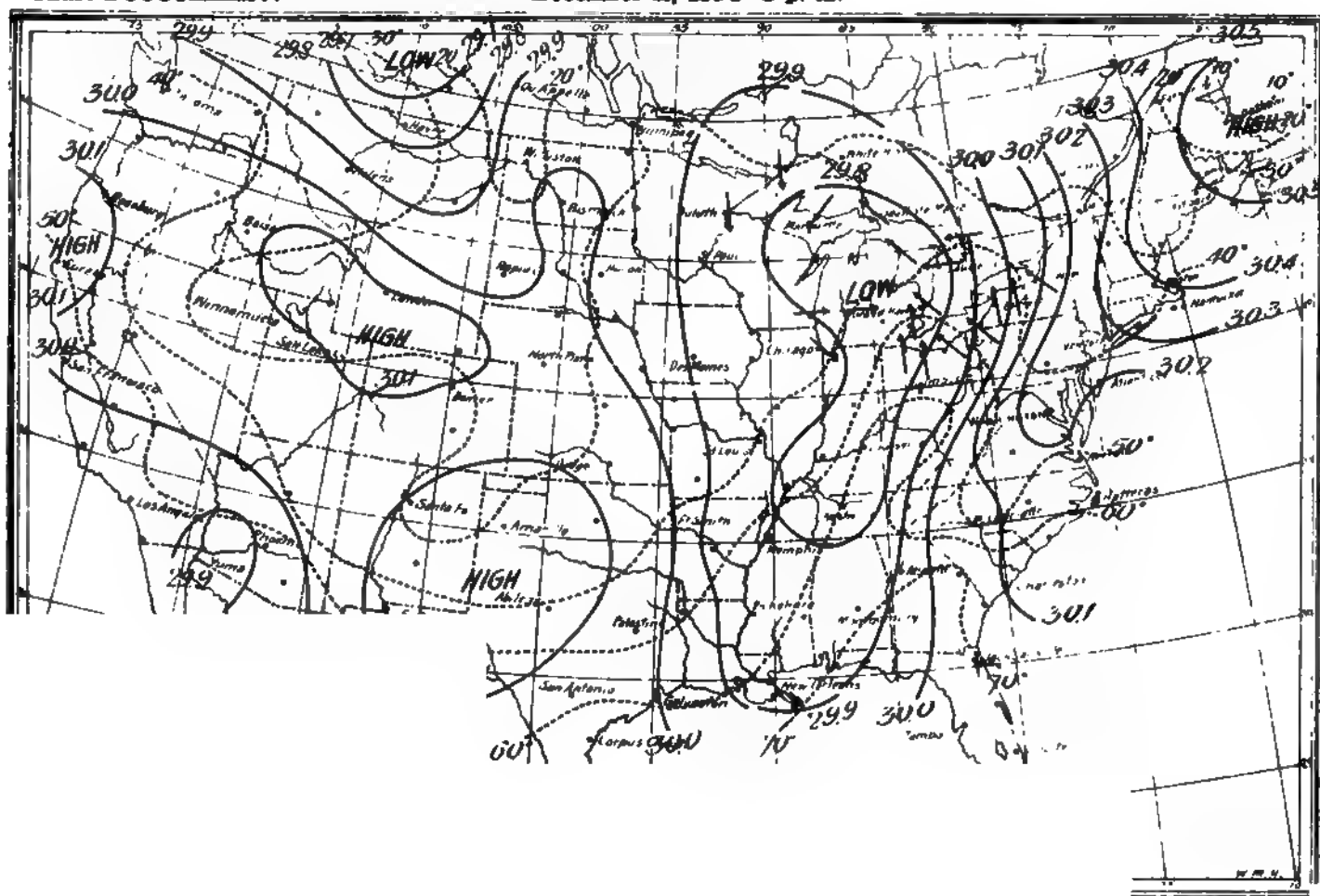


Chart D0000XXXV.

December 12, 1894—8 a. m.

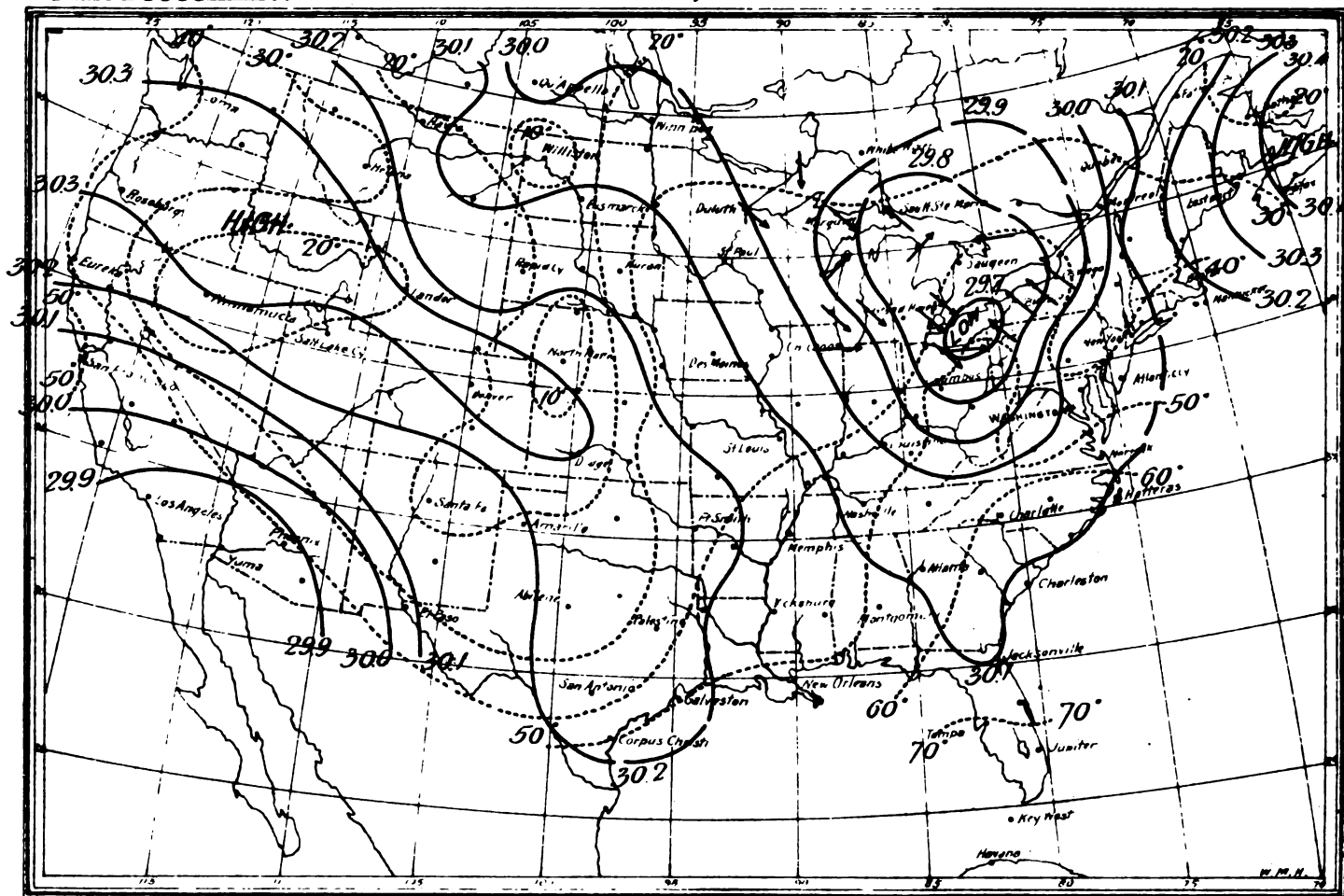


Chart D0000XXXVI.

December 12, 1894—8 p. m.

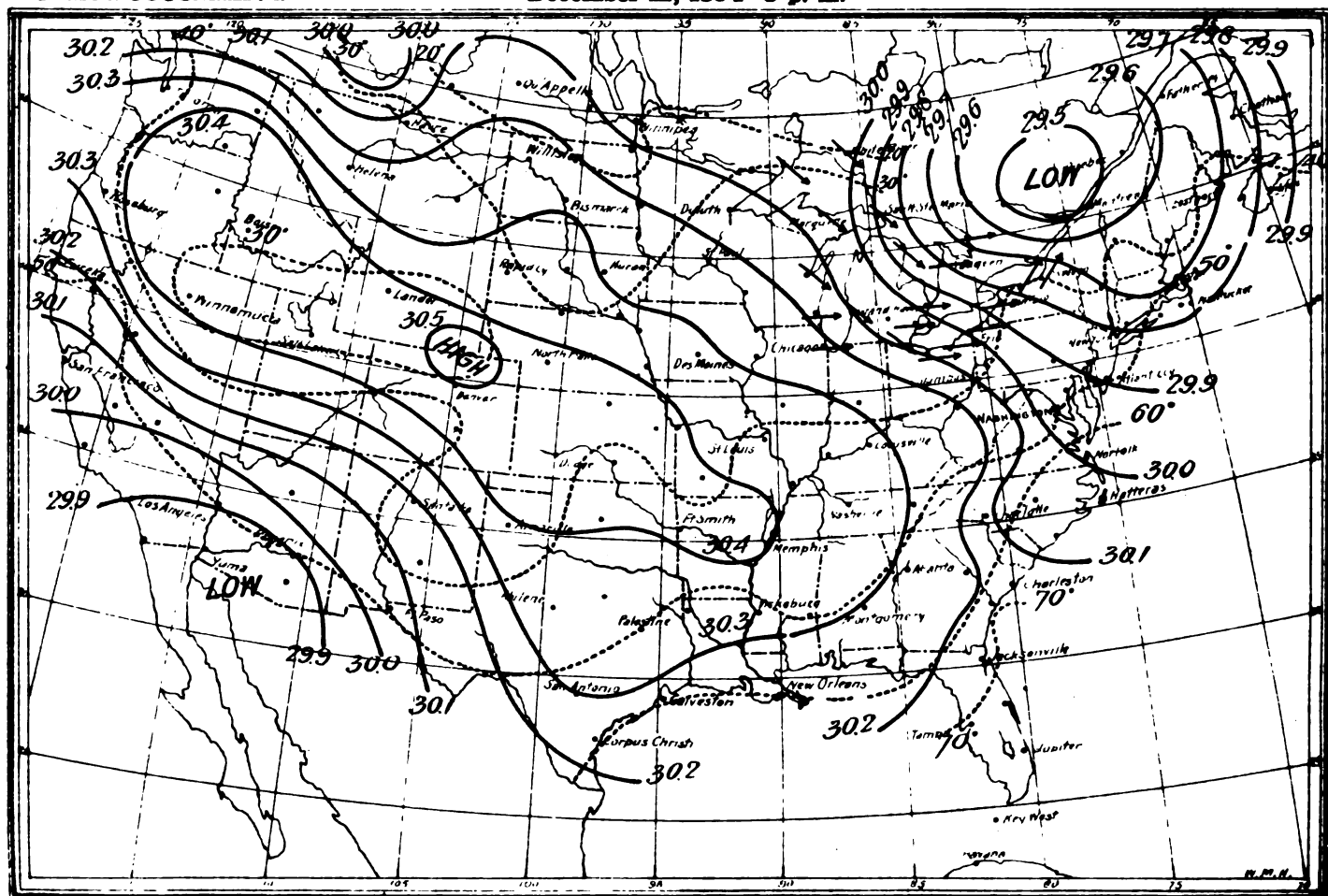


Chart D0000XXXVII

December 24, 1895-8 a. m.

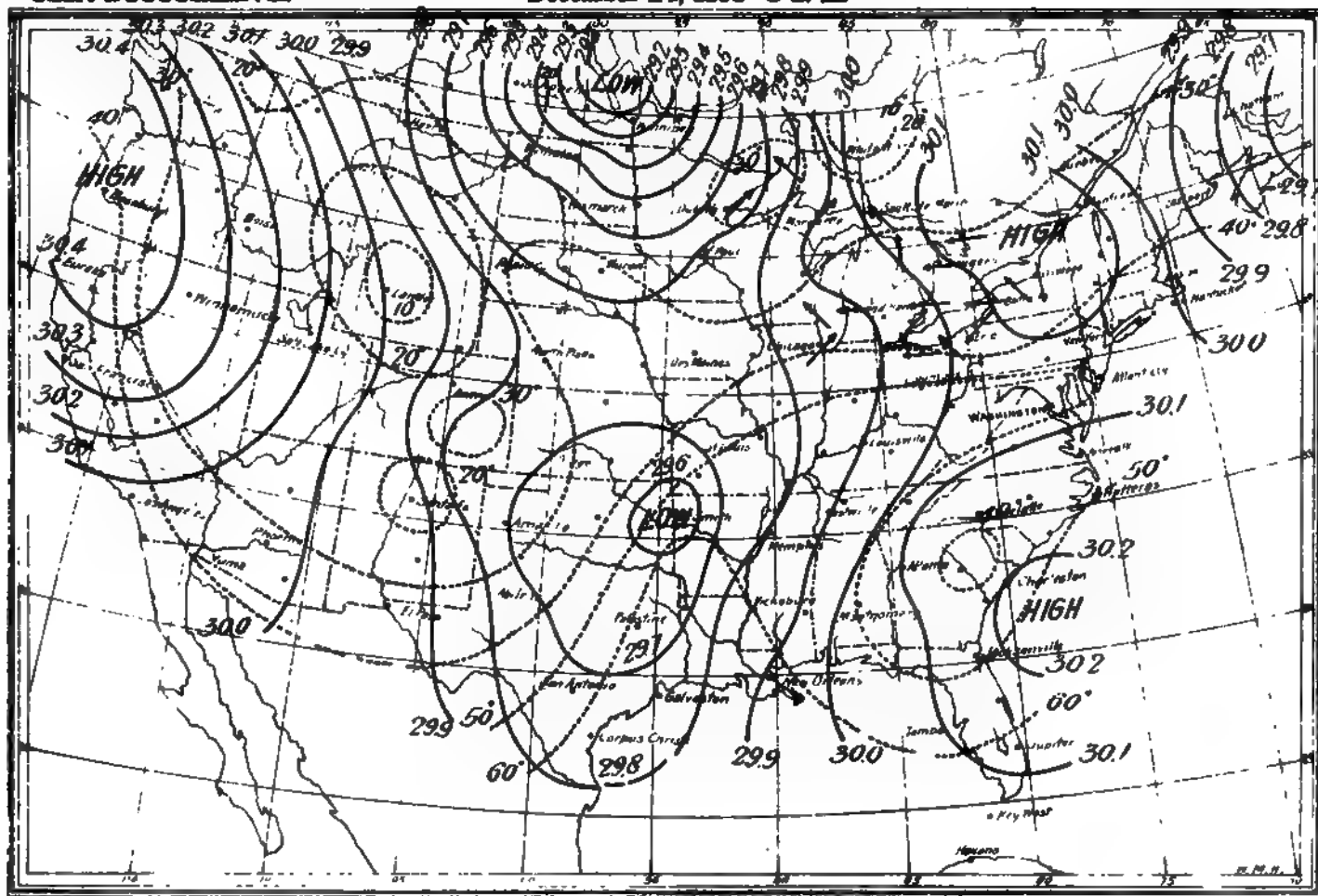


Chart D0000XXXVIII

December 24, 1895-8 p. m.

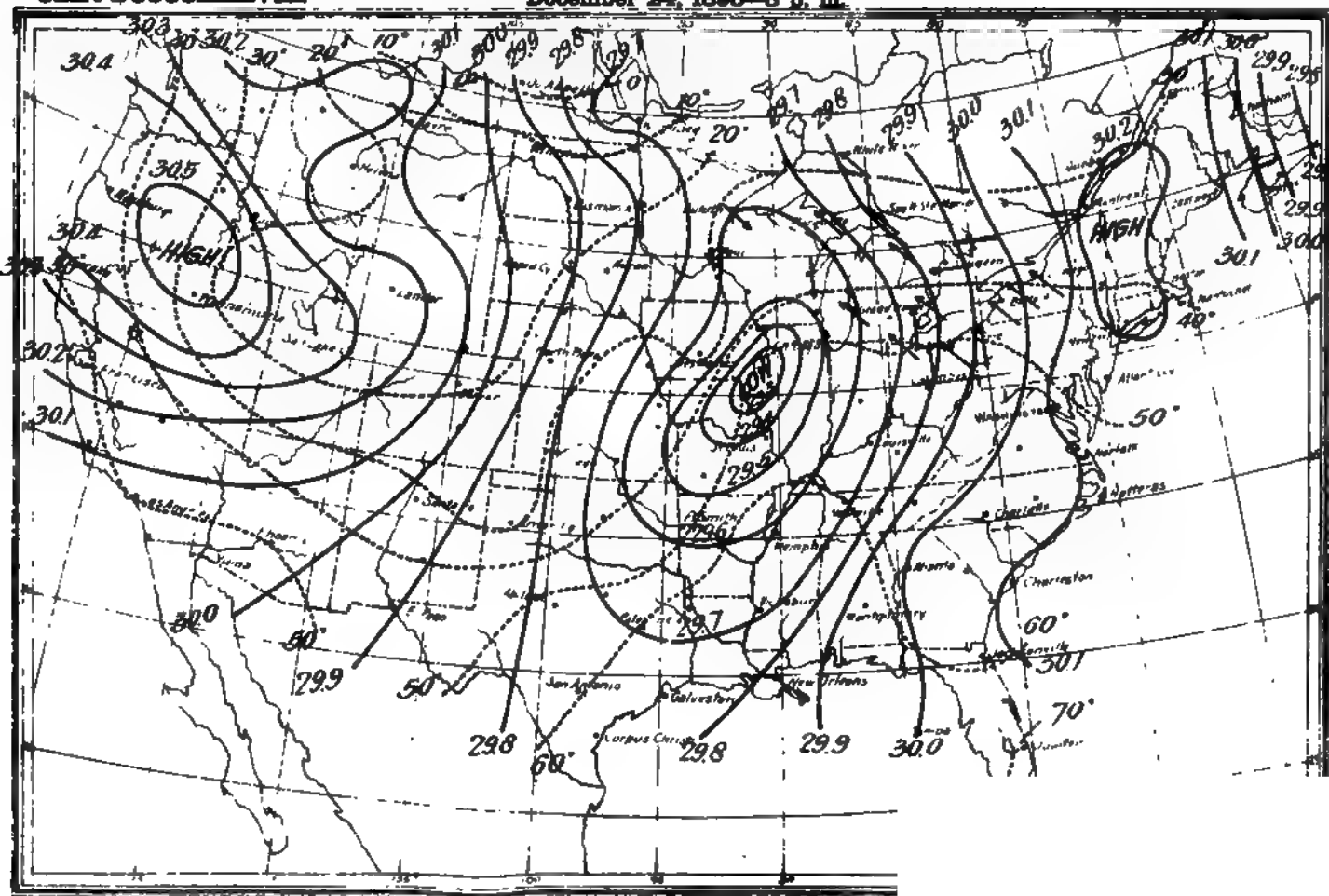


Chart DCCCCXLI.

December 29, 1895—8 a. m.

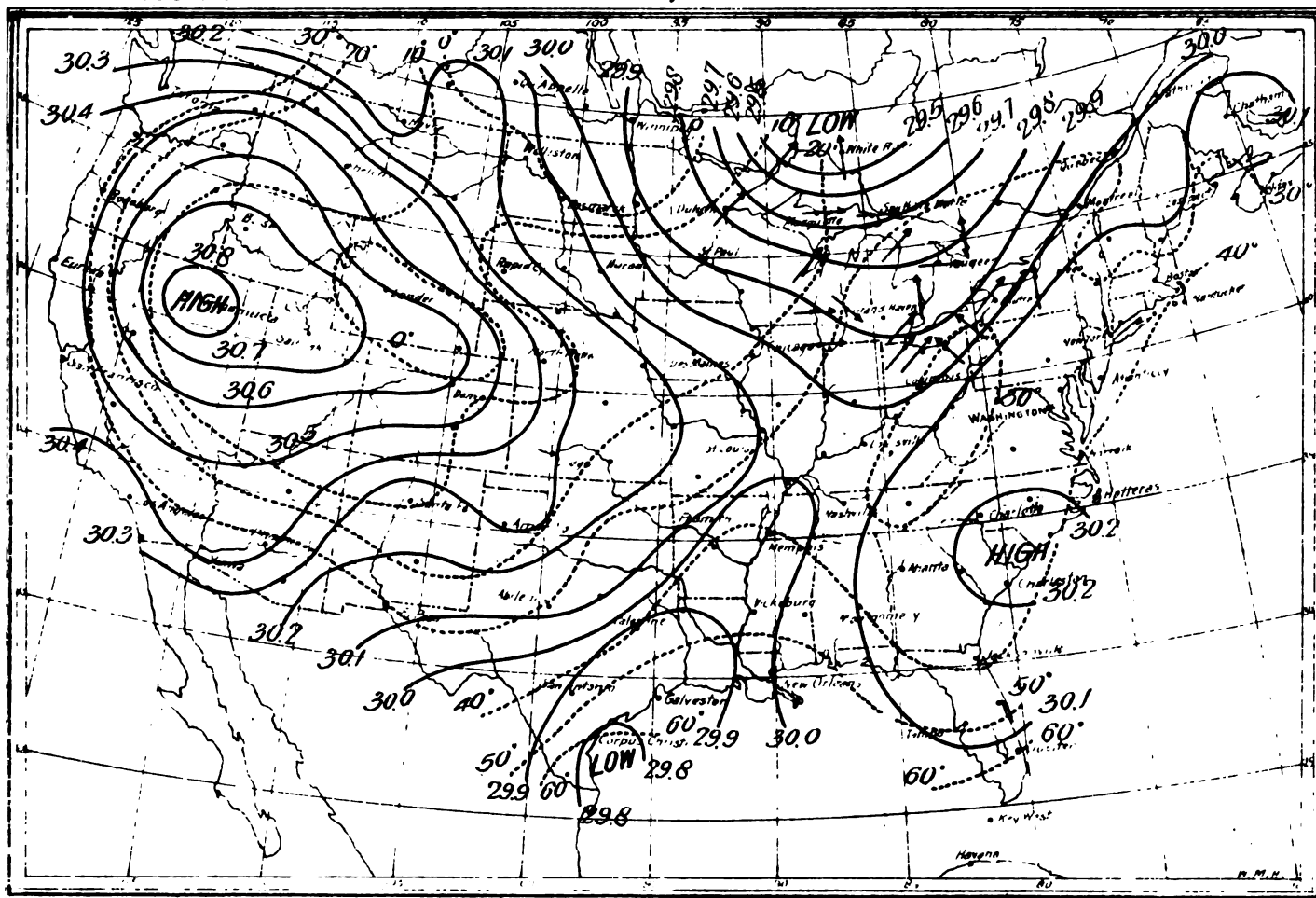


Chart DCCCCXLII.

December 29, 1895—8 p. m.

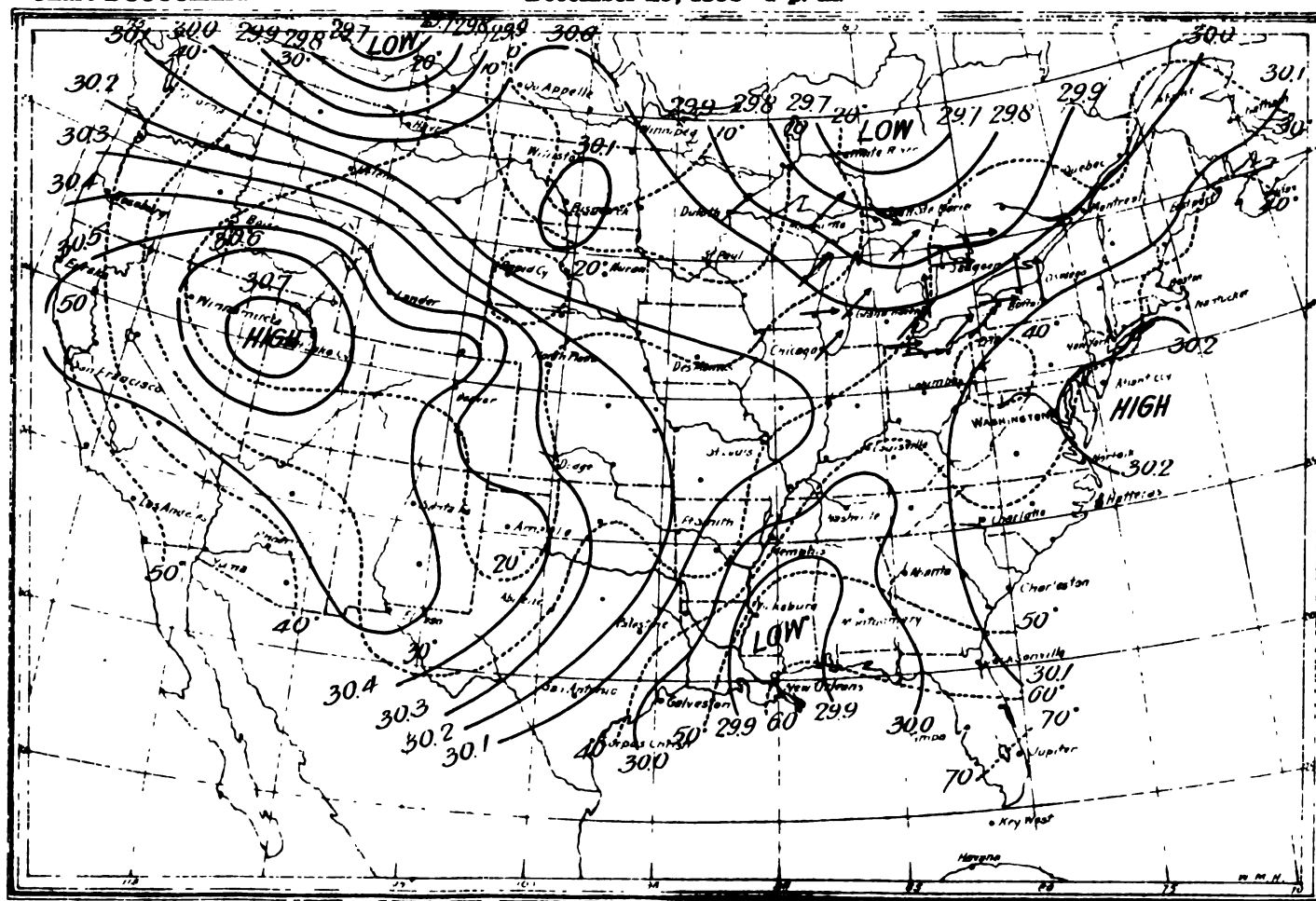


Chart D0000XLIII.

December 30, 1895—8 a. m.

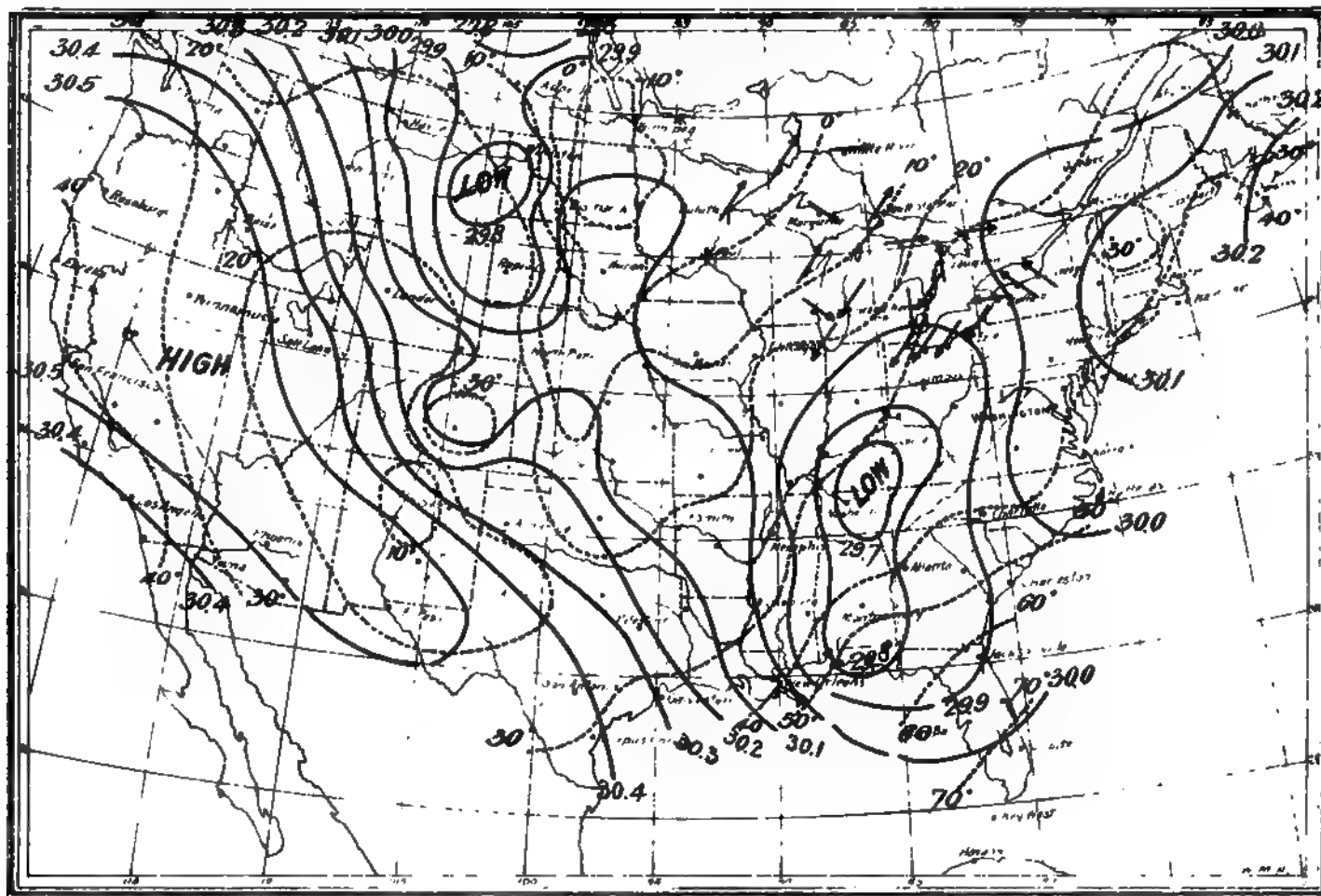


Chart D0000XLIV.

December 30, 1895—8 p. m.

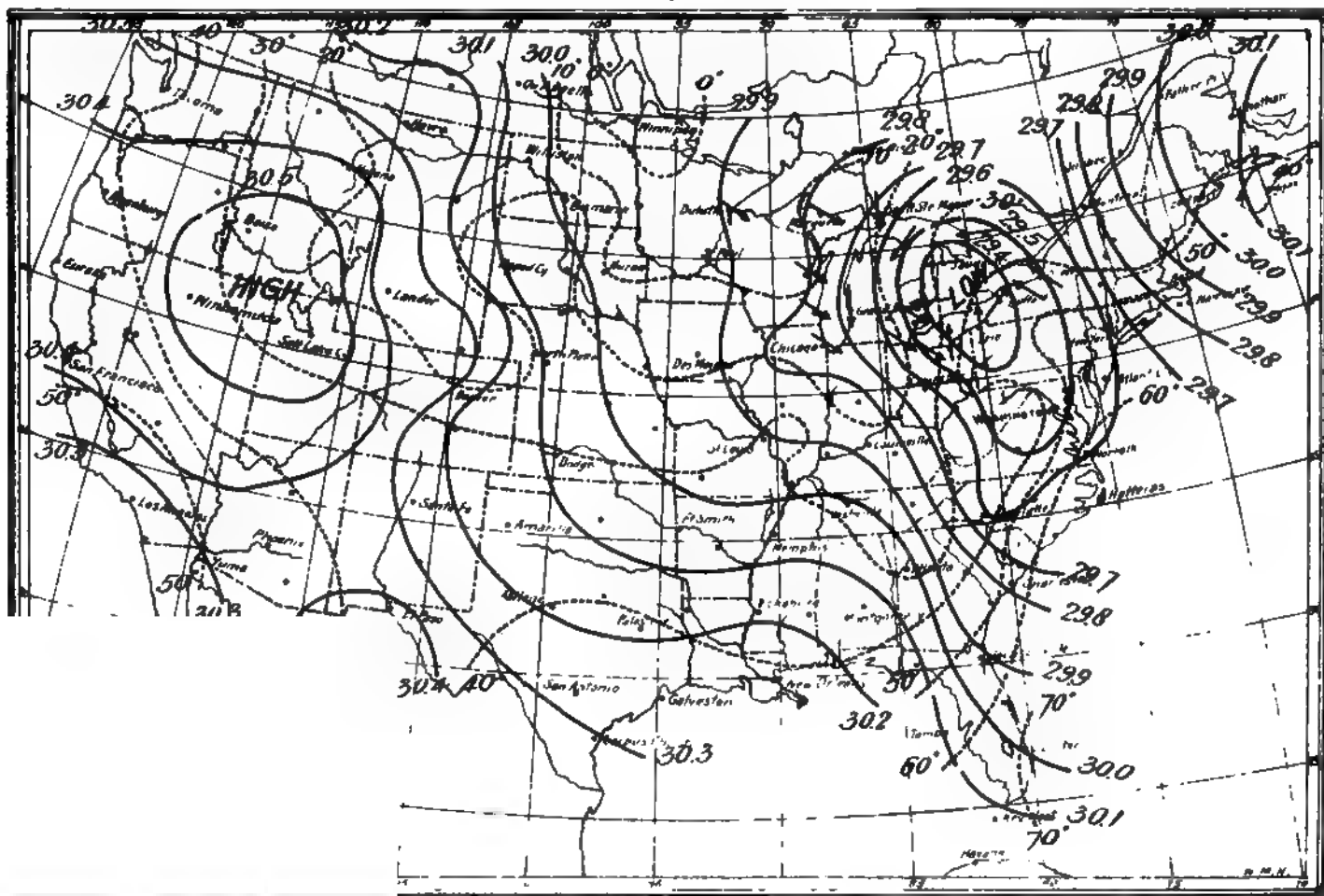


Chart DCCCCXLV.

December 12, 1906—8 a. m.

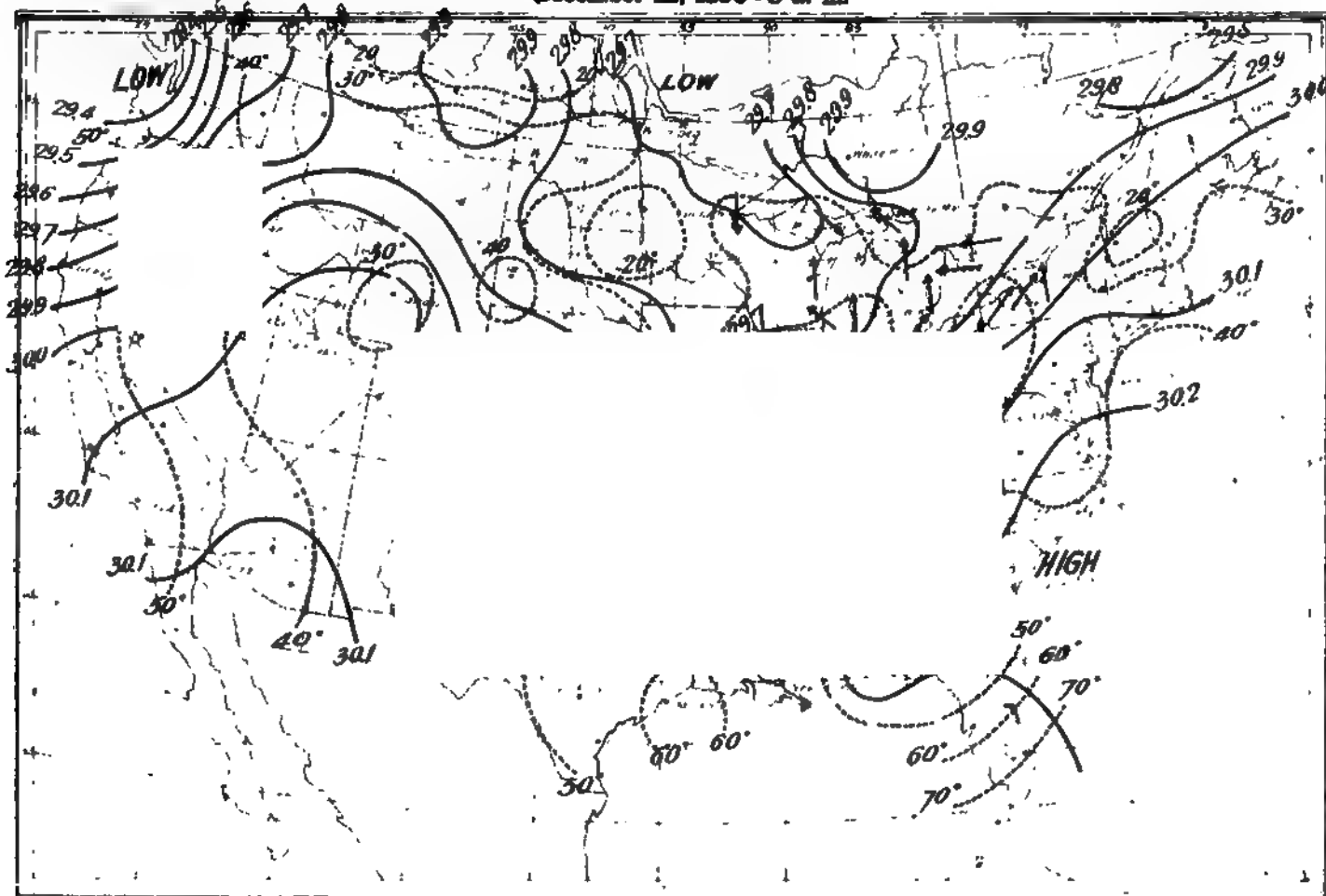


Chart DCCCCXLVI.

December 12, 1906—8 p. m.

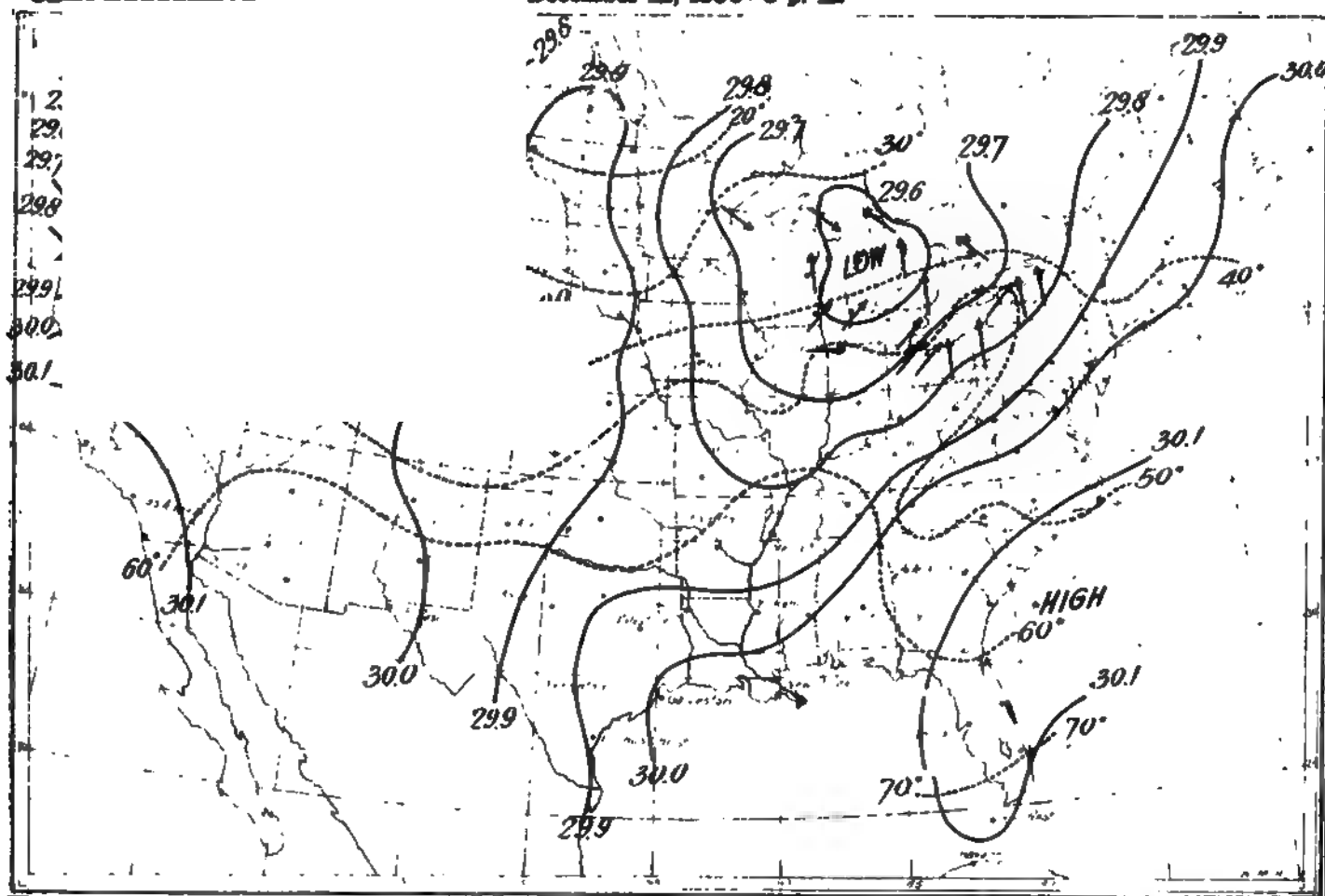


Chart DCCCCXLVII

December 13, 1896—8 a. m.

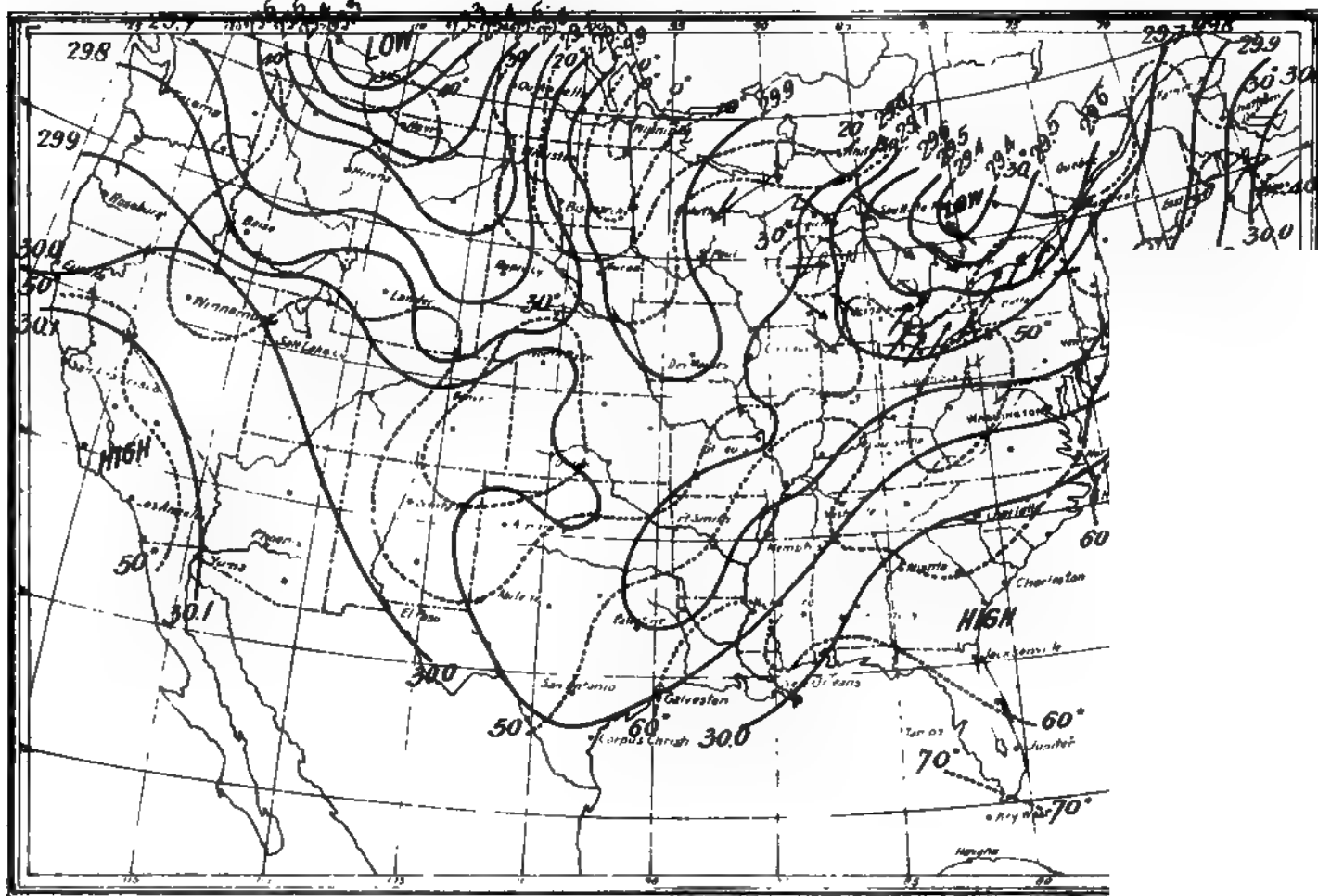
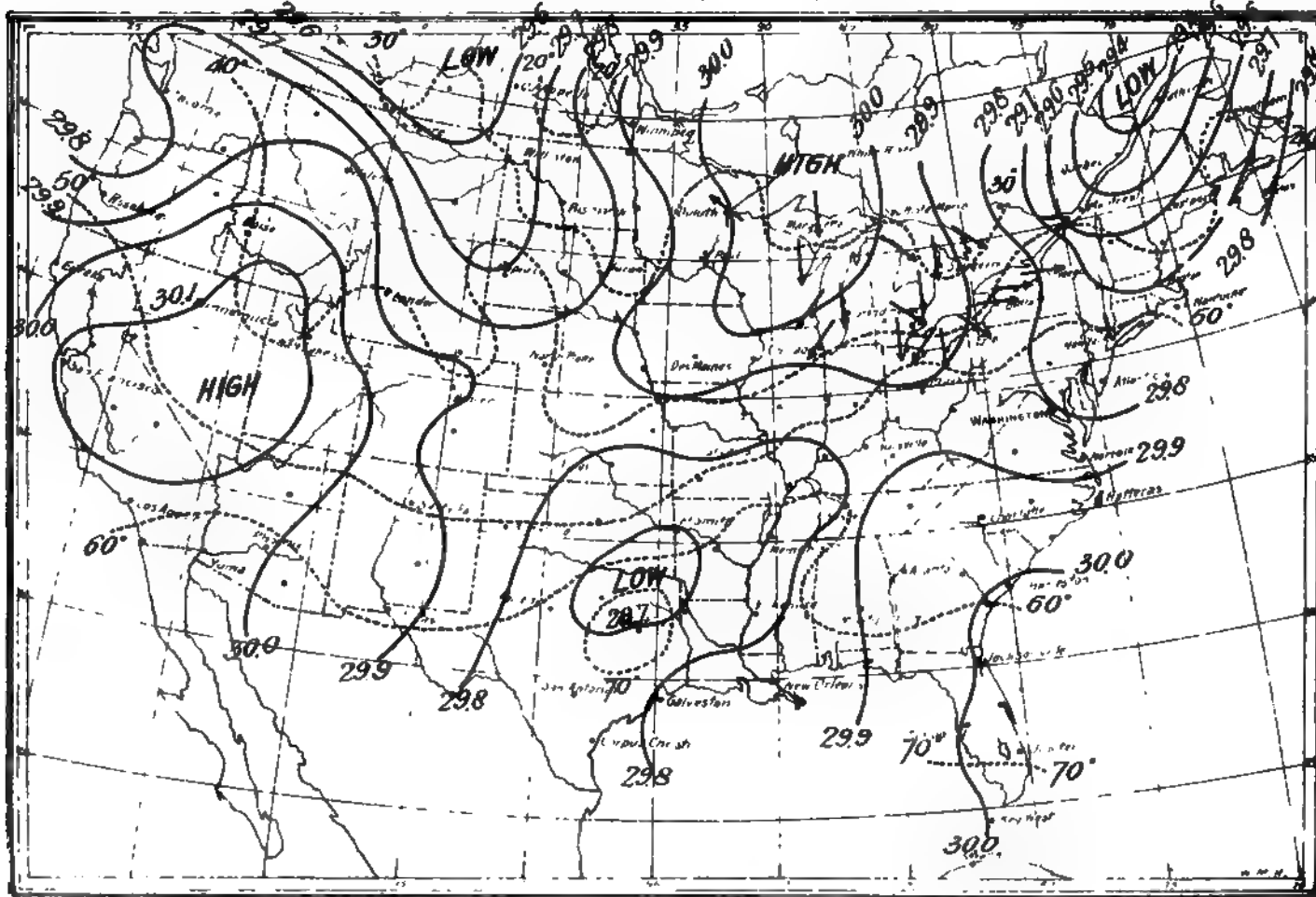
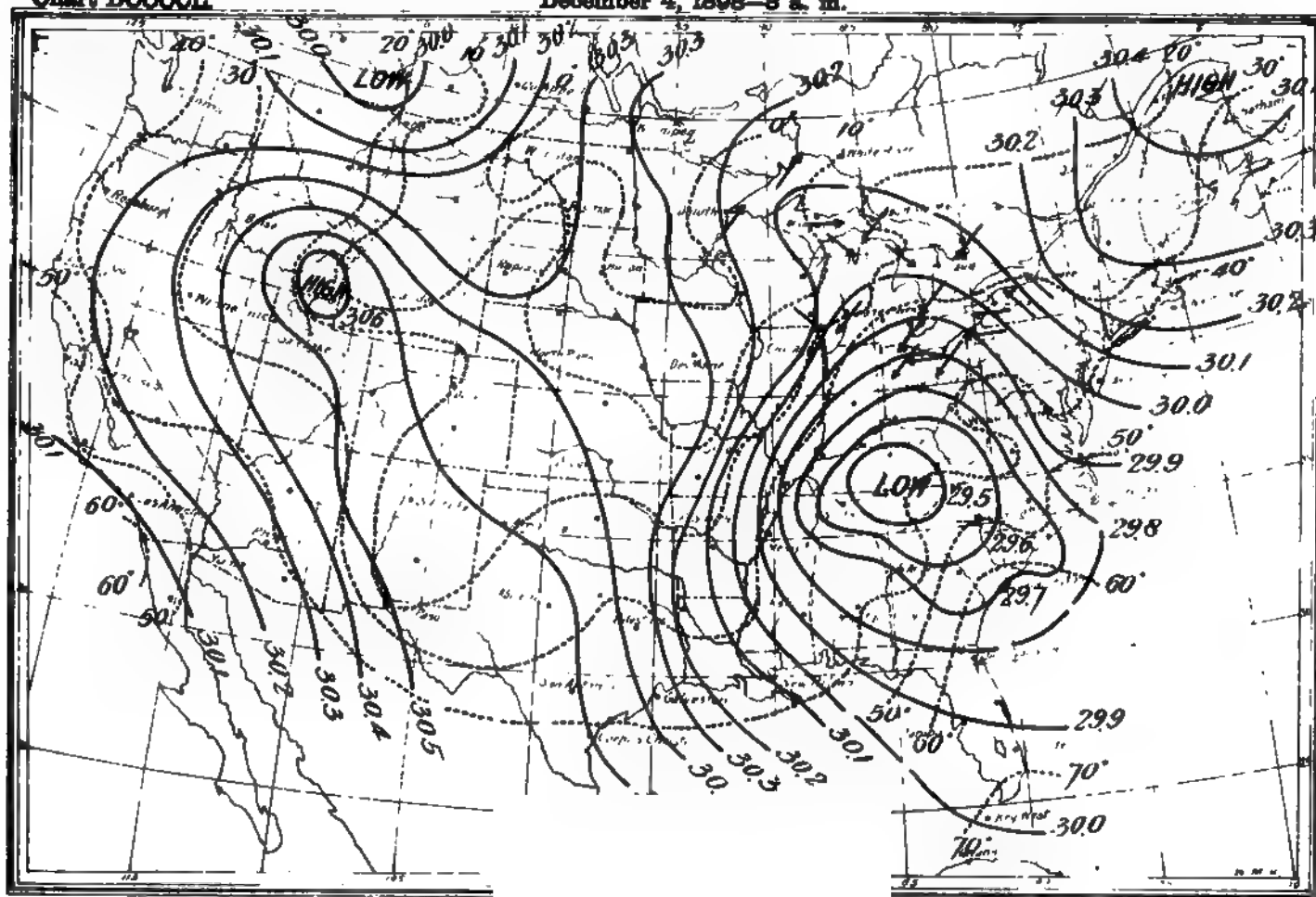
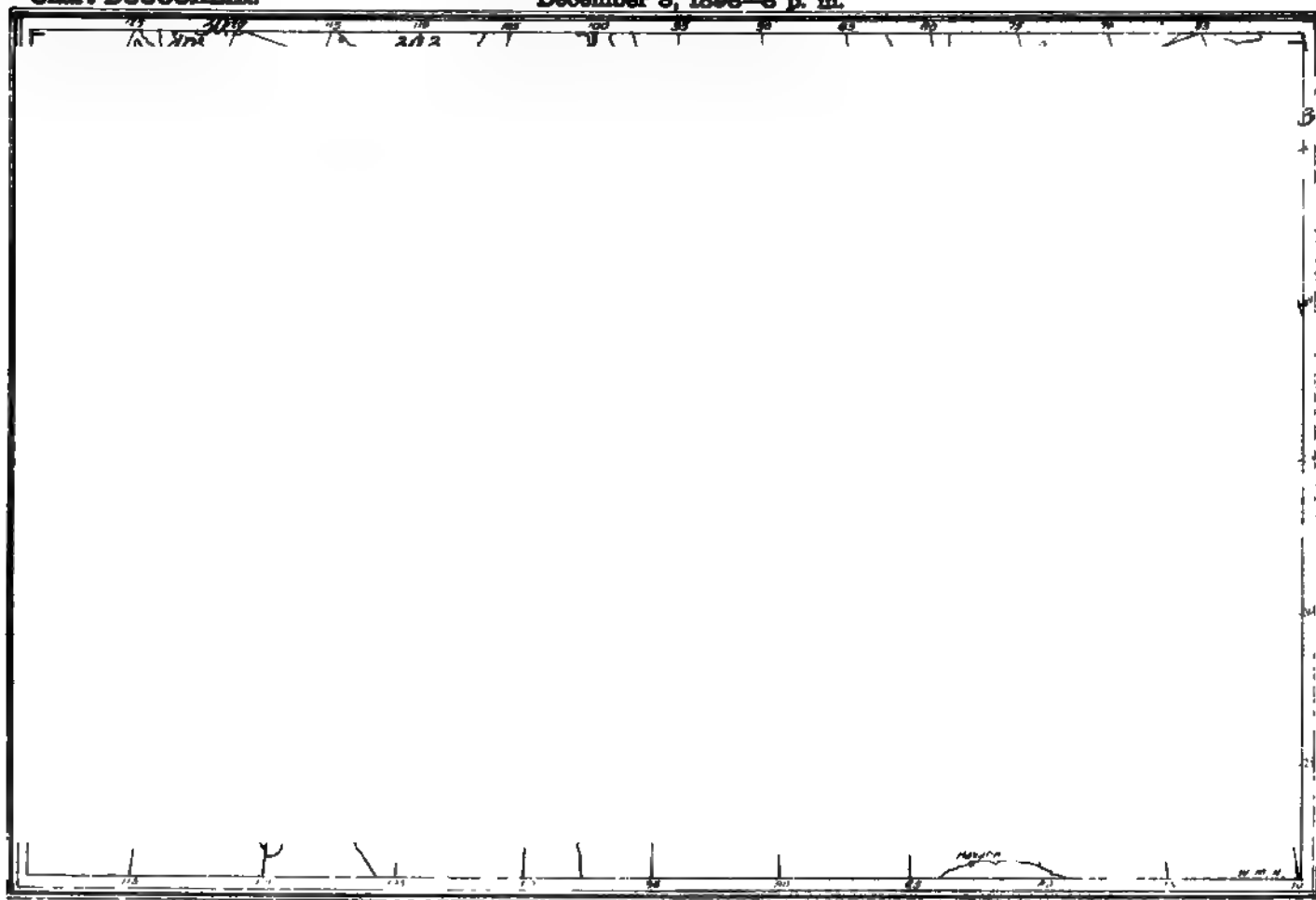


Chart DCCCCXLVIII

December 13, 1896—8 p. m.





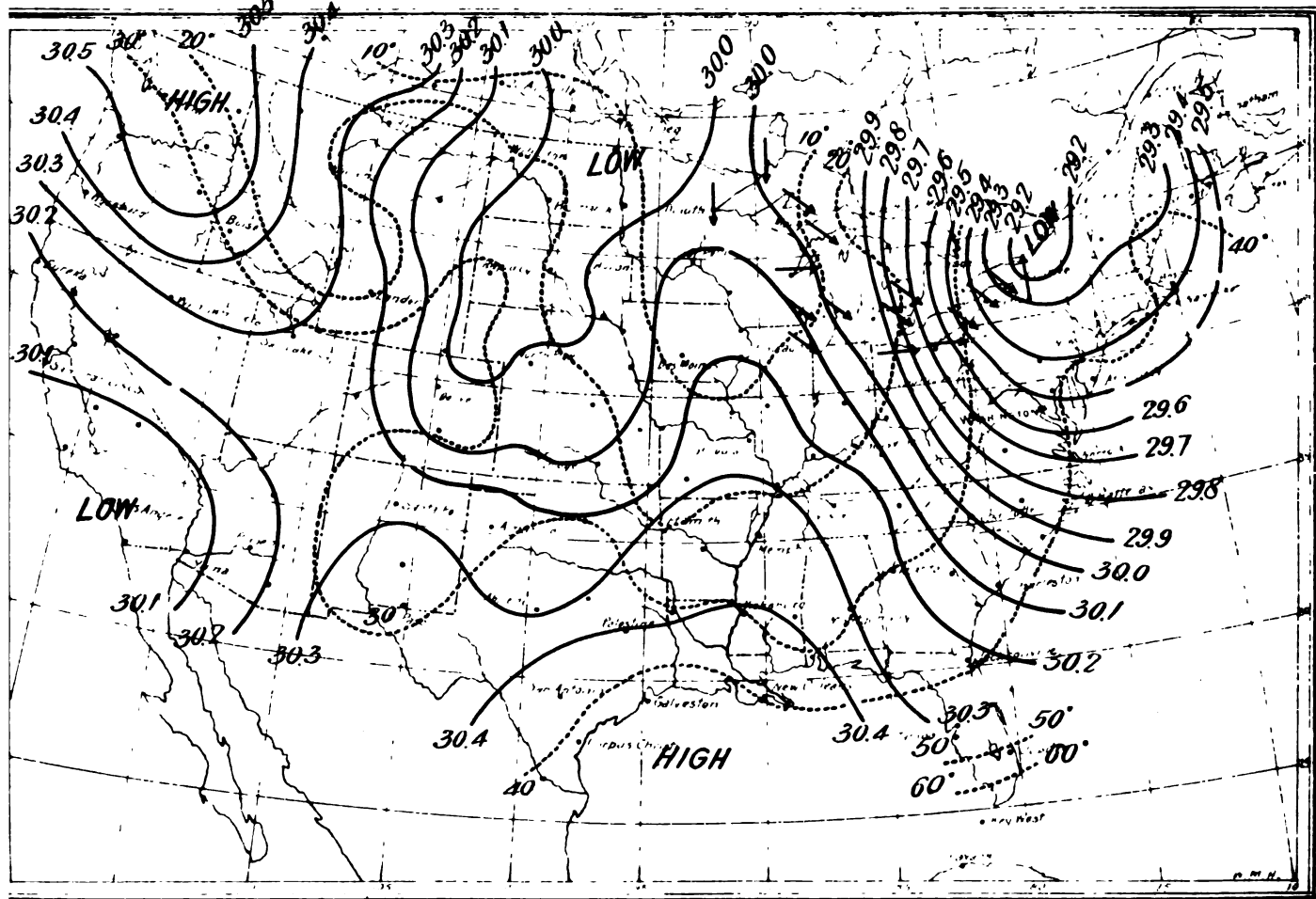
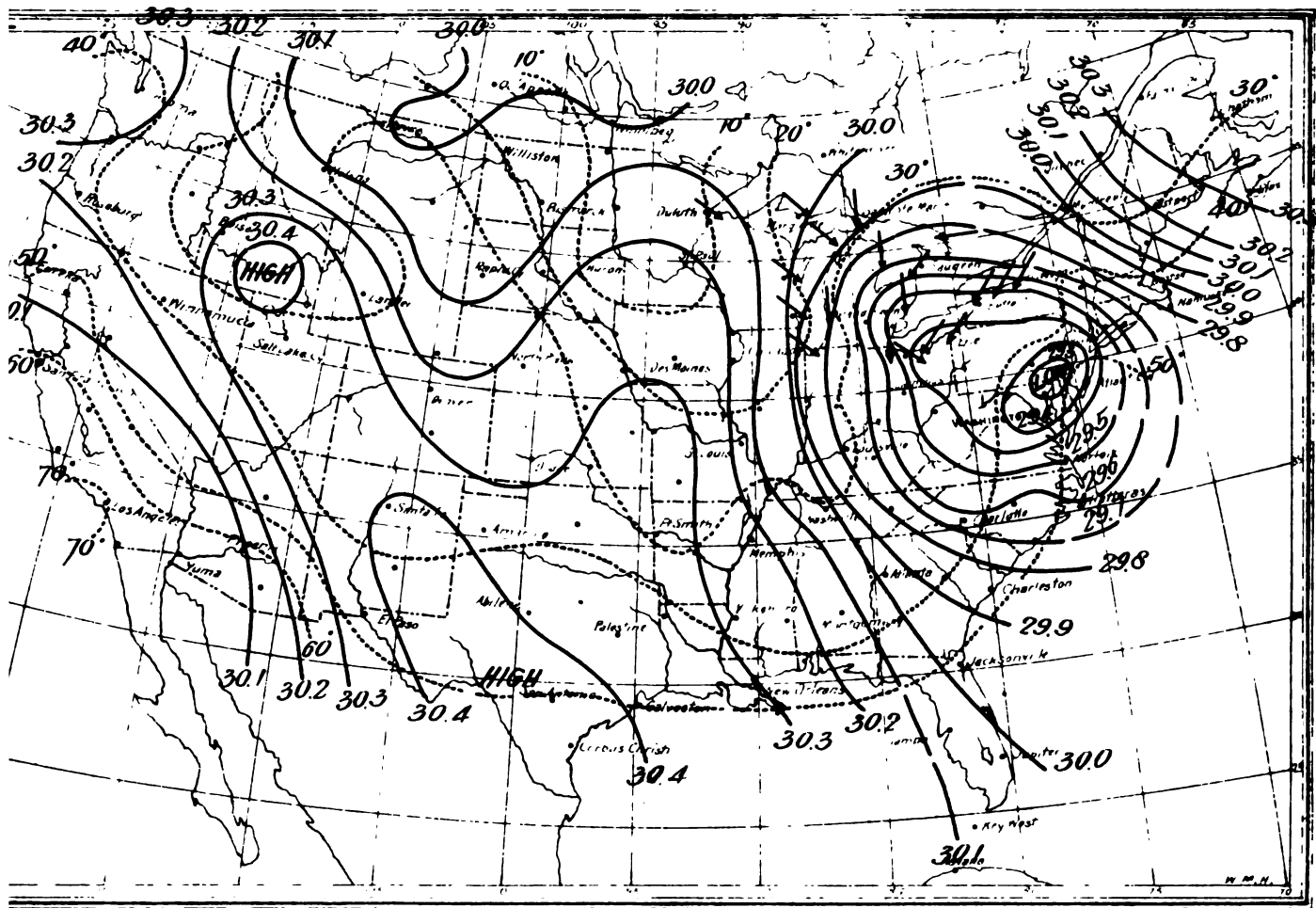


Chart D0000LIII.

December 10, 1899—8 p. m.

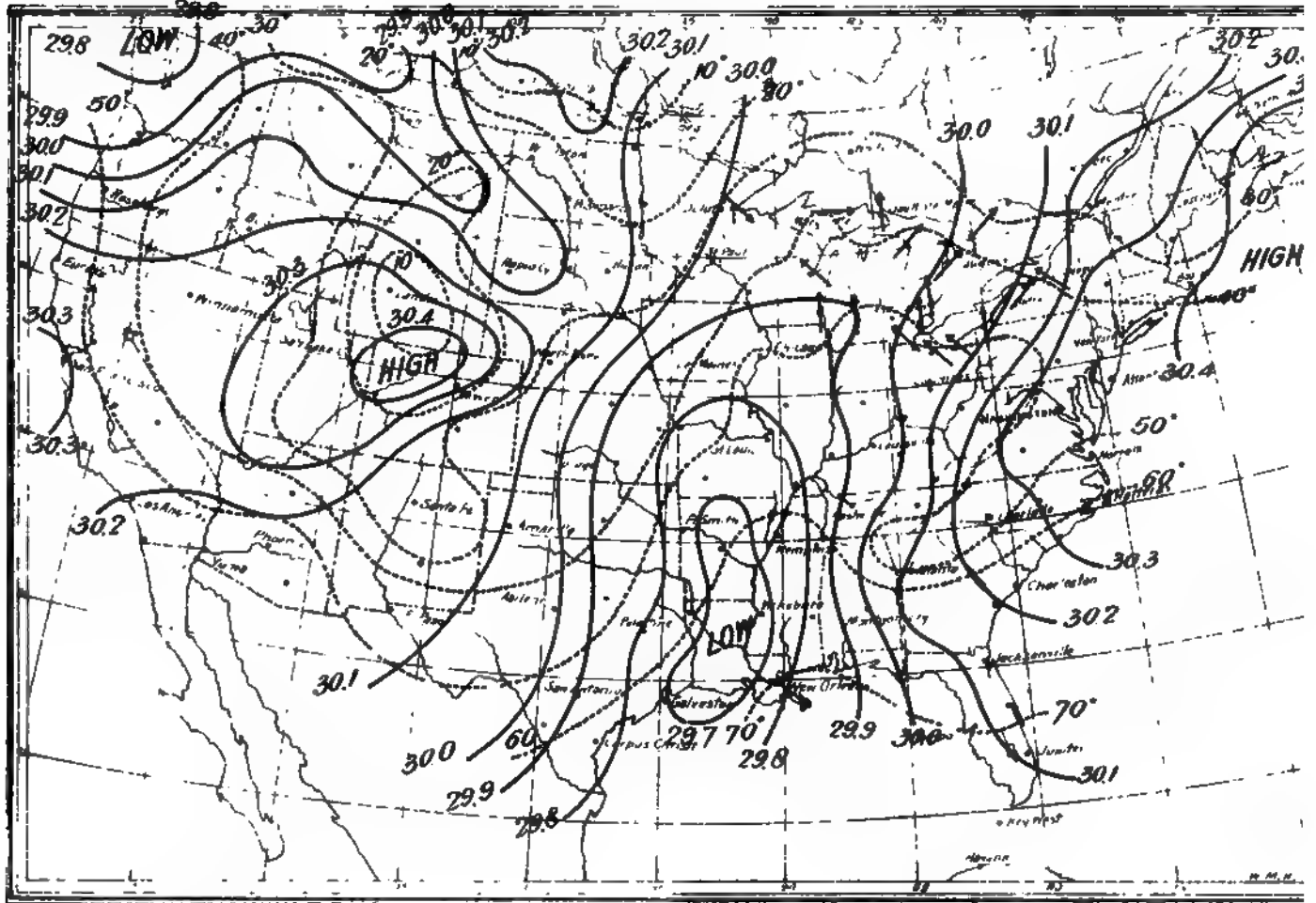


Chart D0000LIV.

December 11, 1899—8 a. m.



Chart D0000LV.

December 11, 1899—6 p. m.

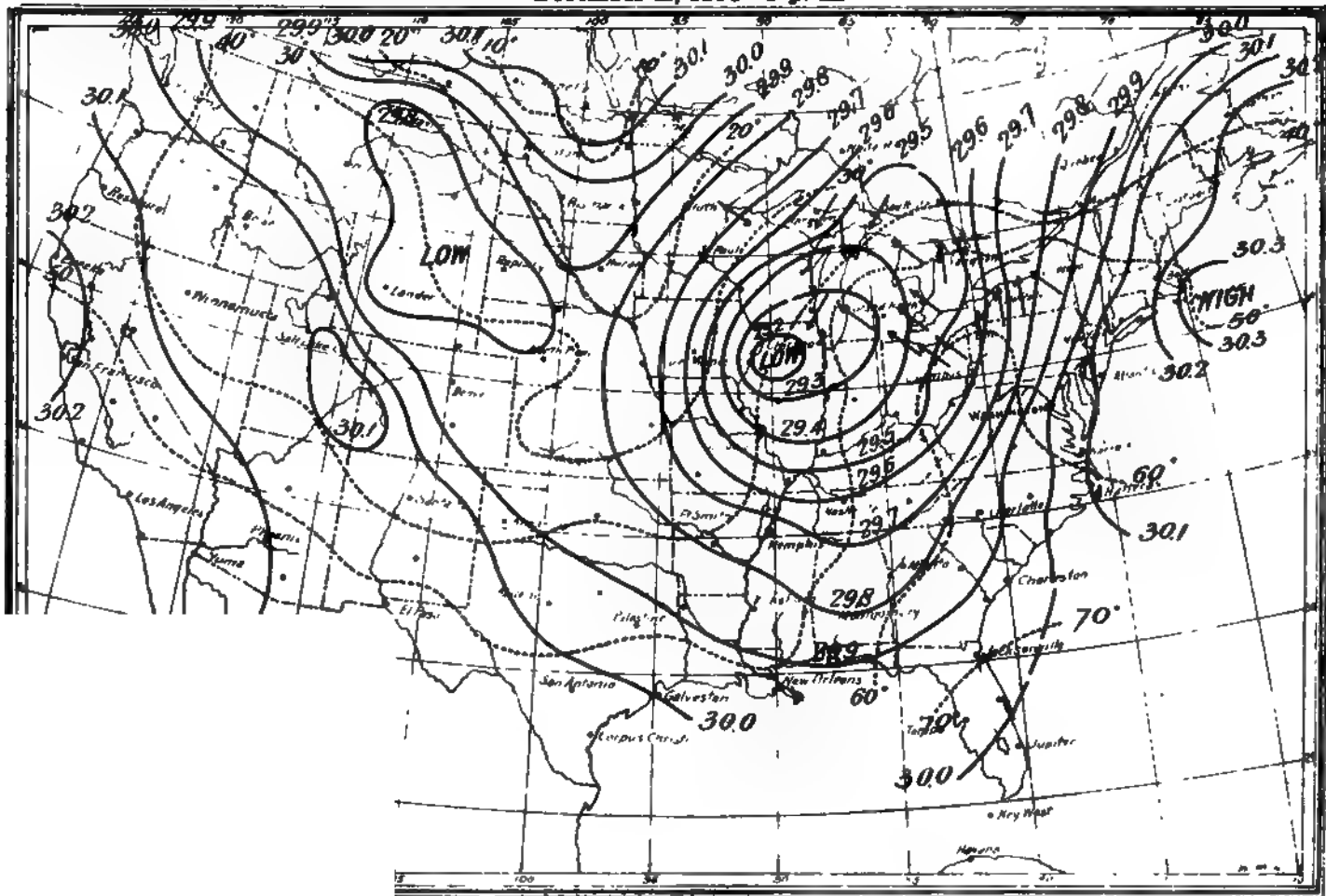


Chart D0000LV.

December 12, 1899—8 a. m.

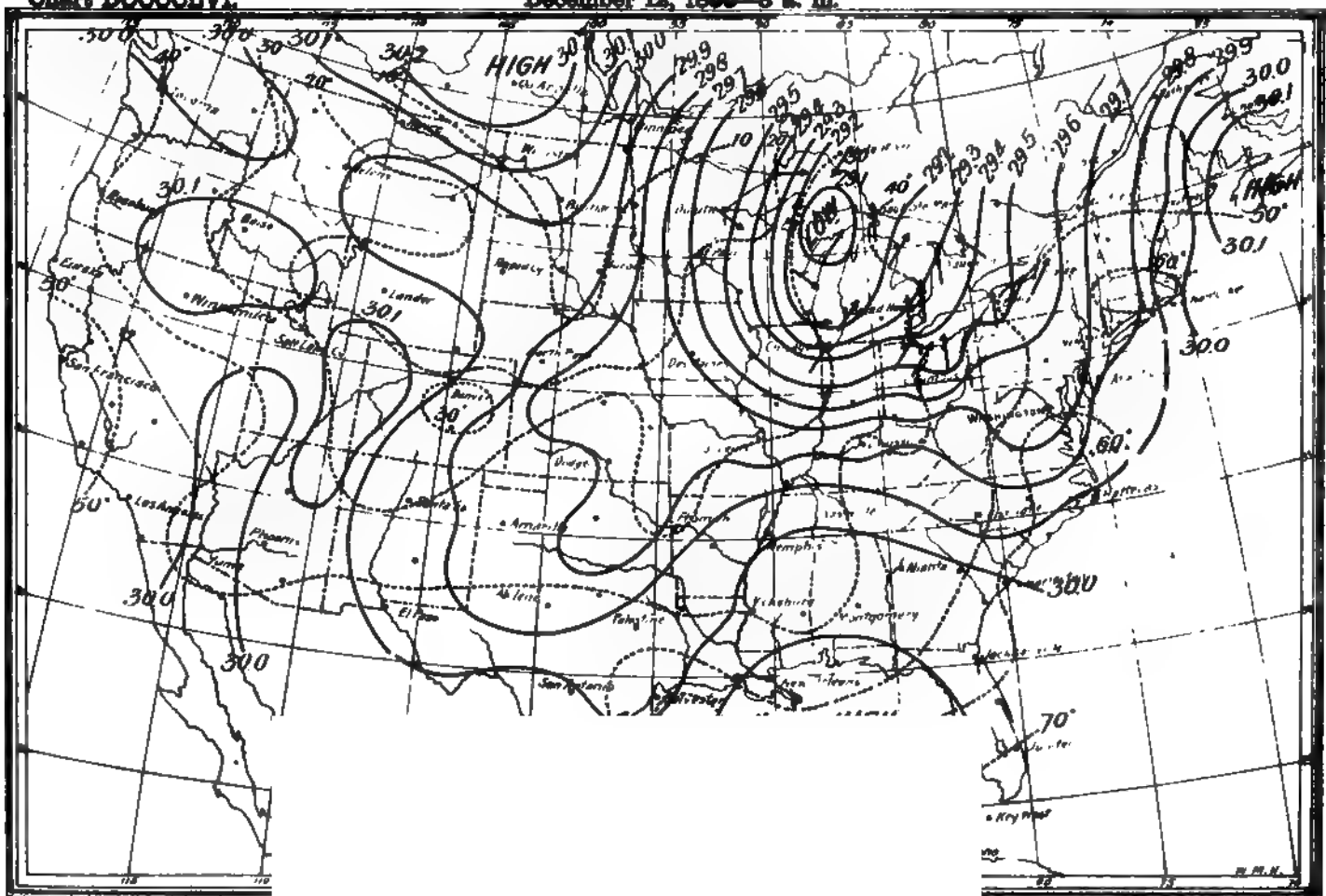


Chart D0000LVII.

December 8, 1900—8 a. m.

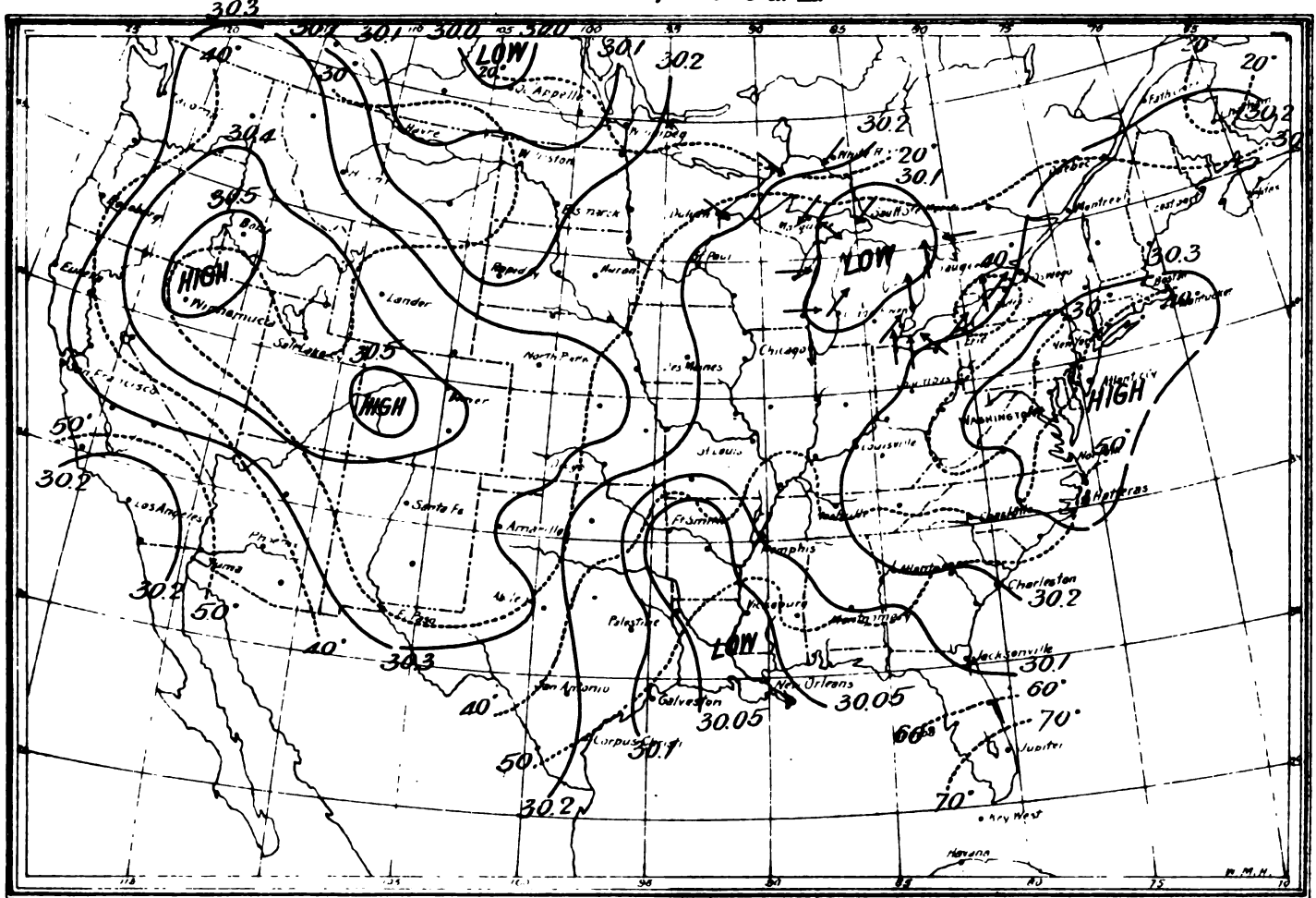
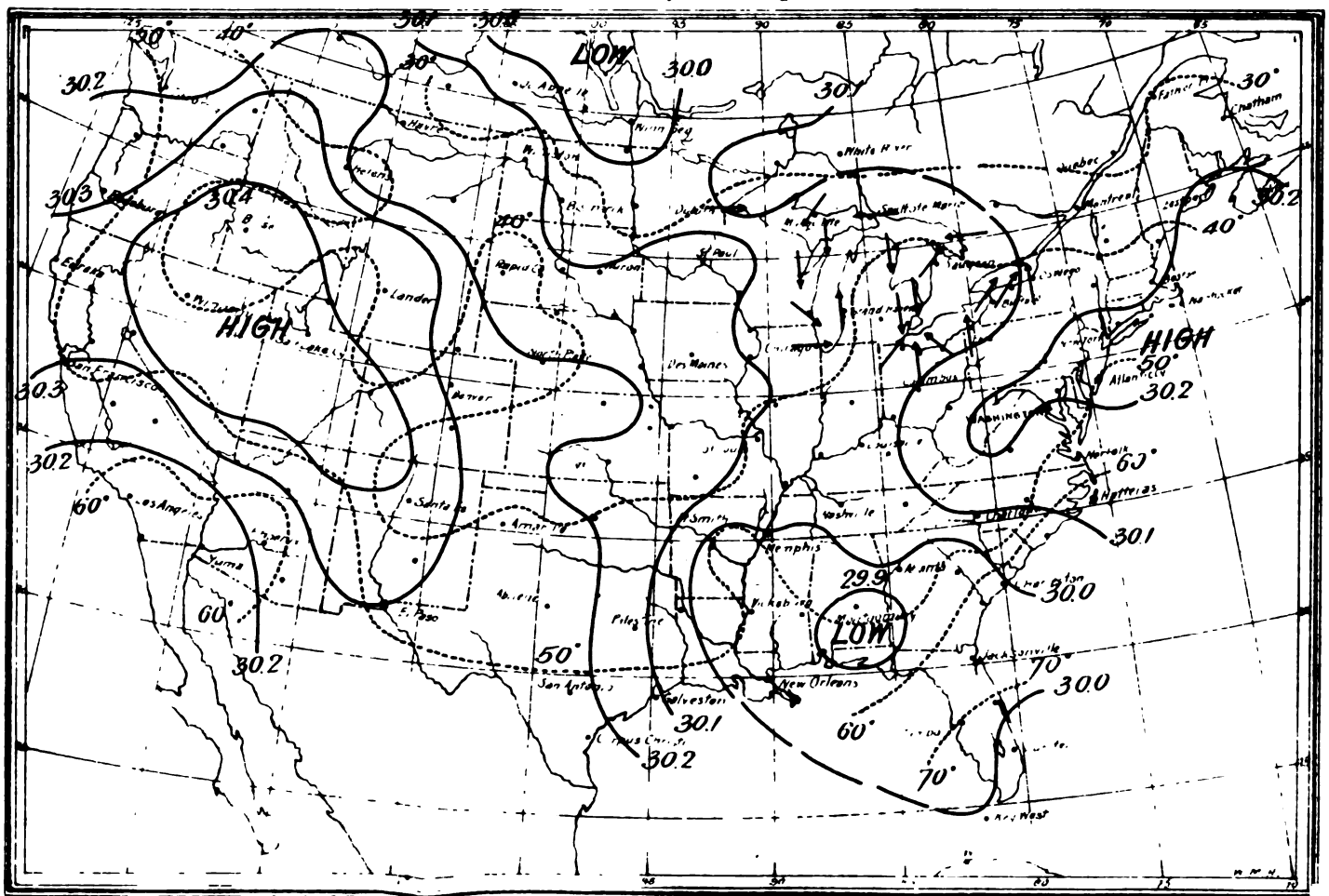


Chart D0000LVIII.

December 8, 1900—8 p. m.



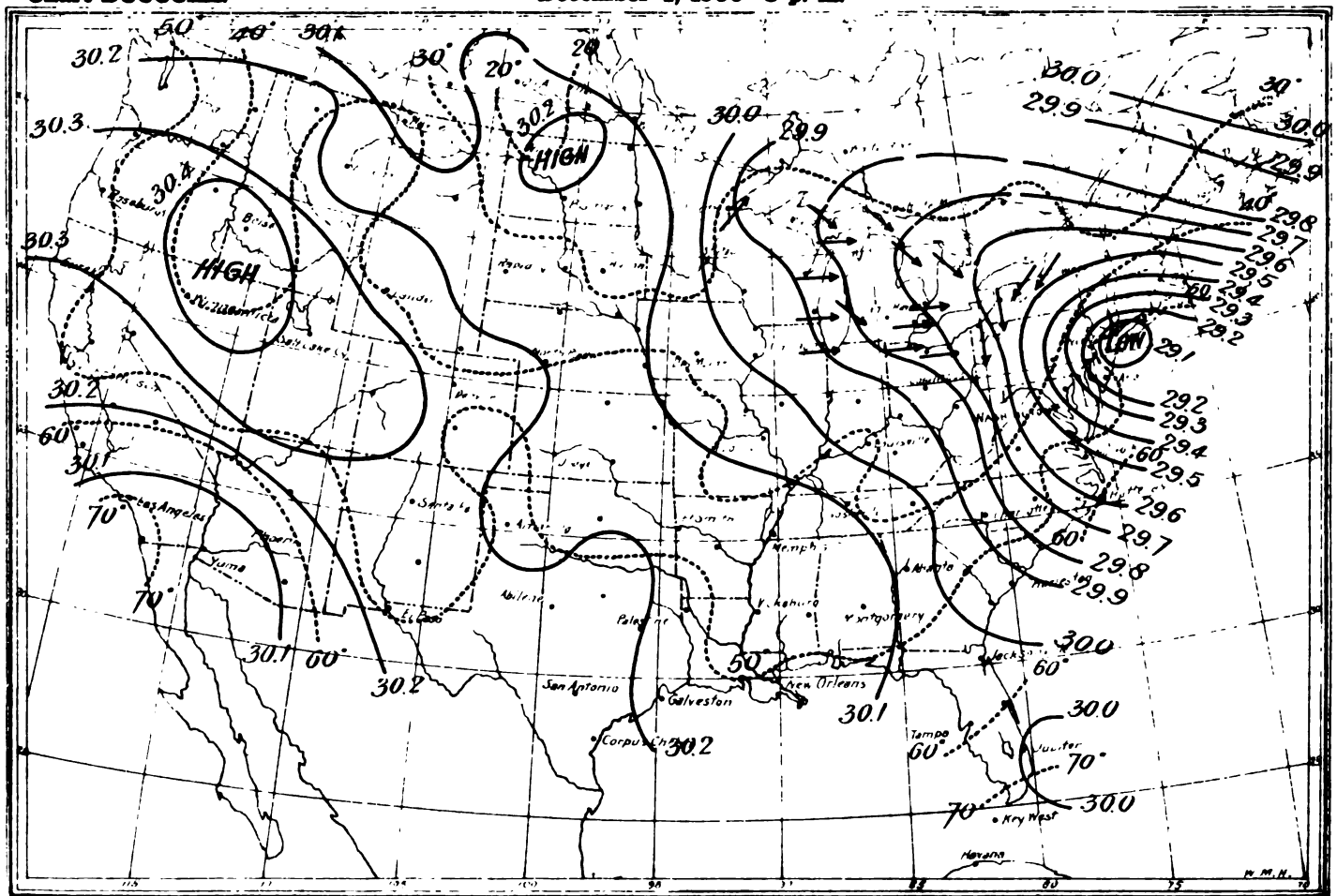
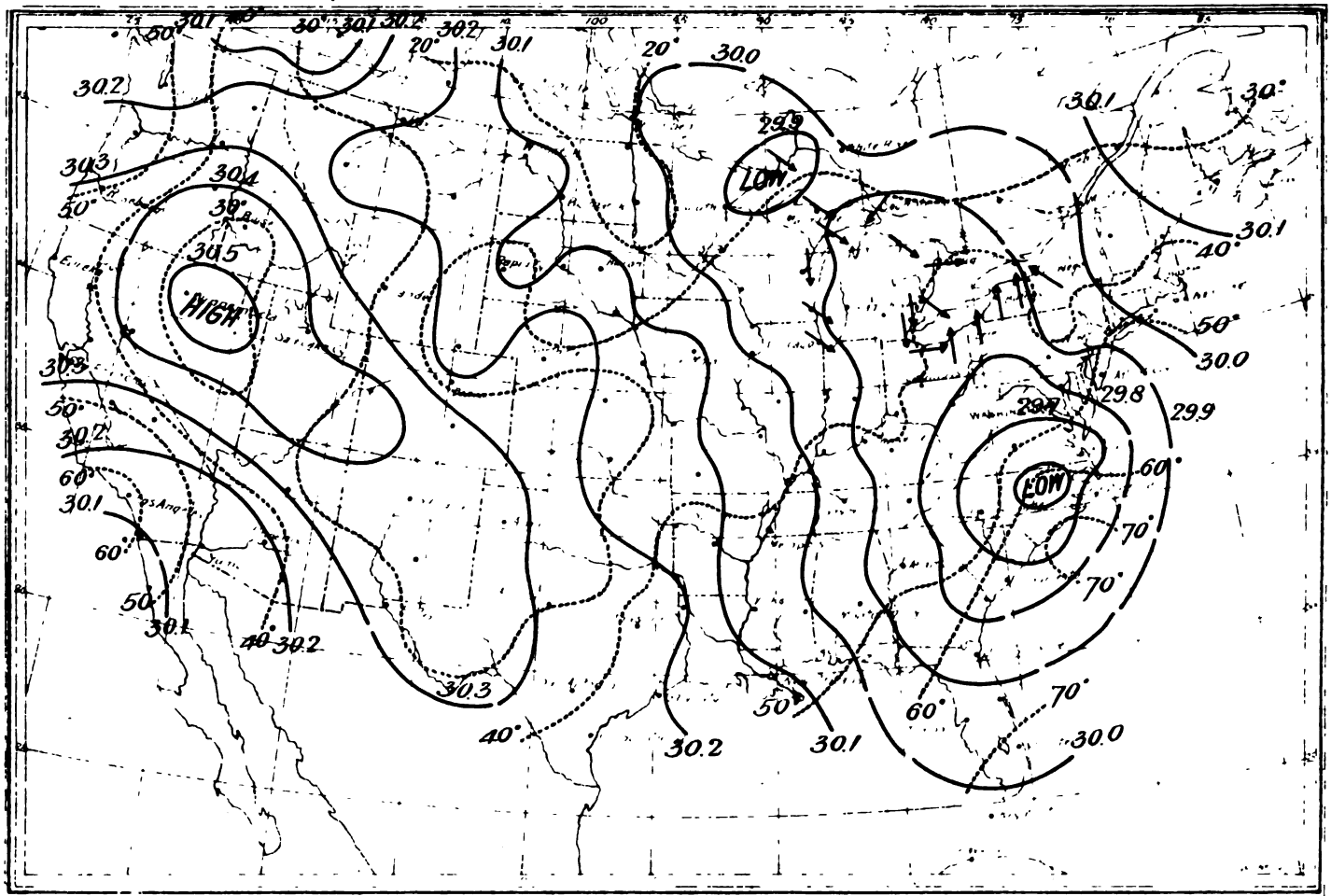


Chart DOOOLXI.

December 7, 1900—8 a. m.

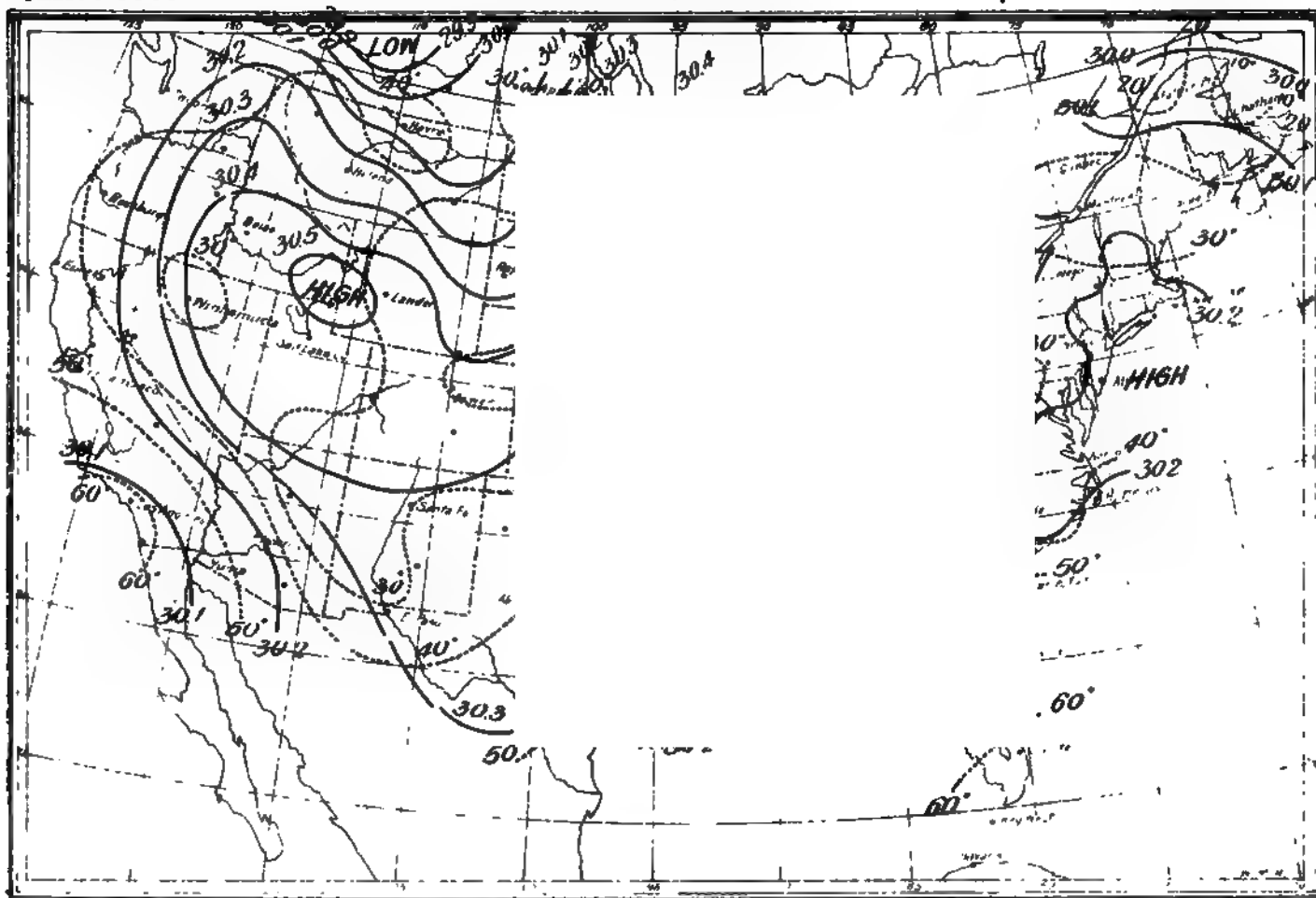


Chart DOOOLXII.

December 7, 1900—8 p. m.

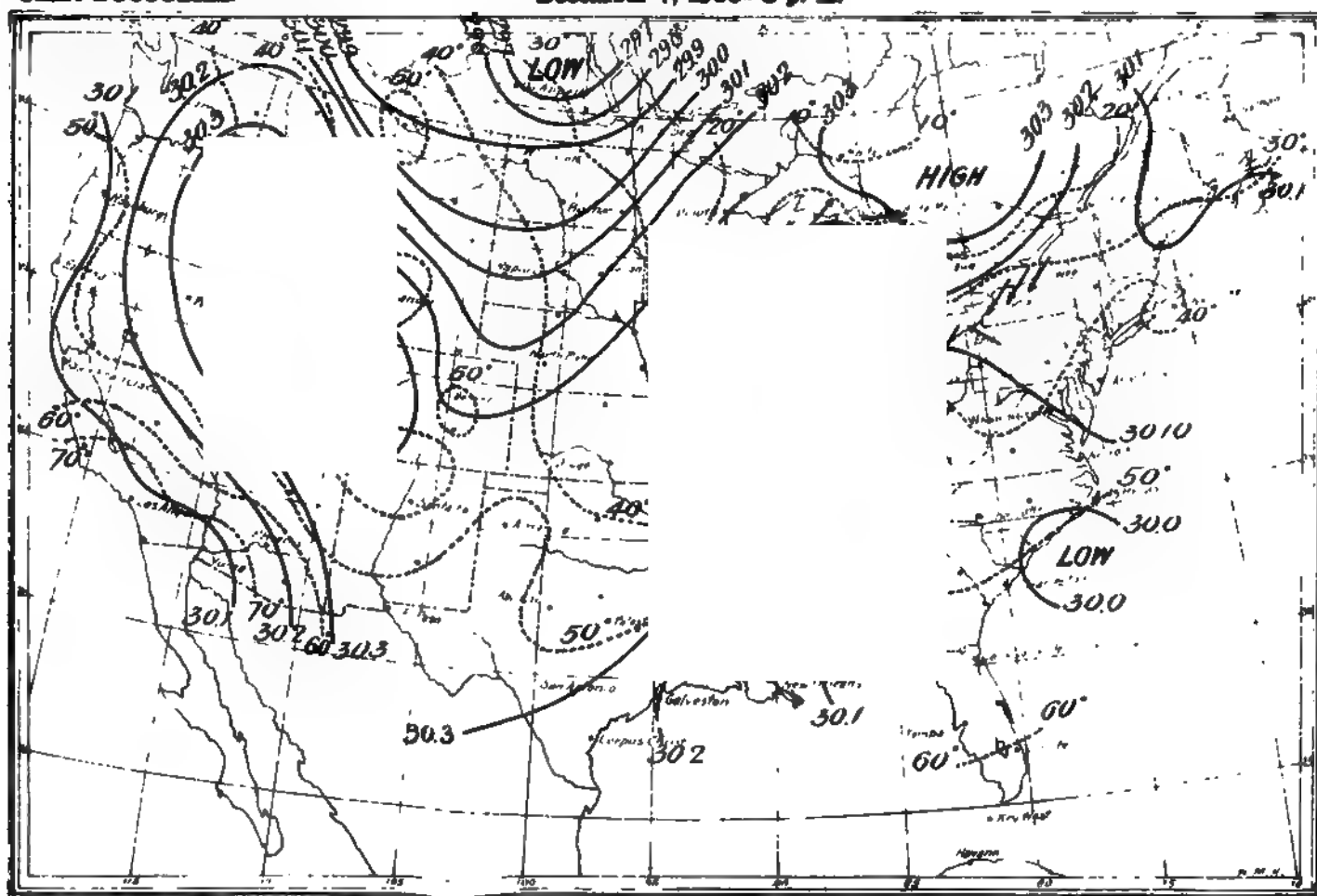


Chart DCCCCXIII.

December 8, 1900—8 a. m.

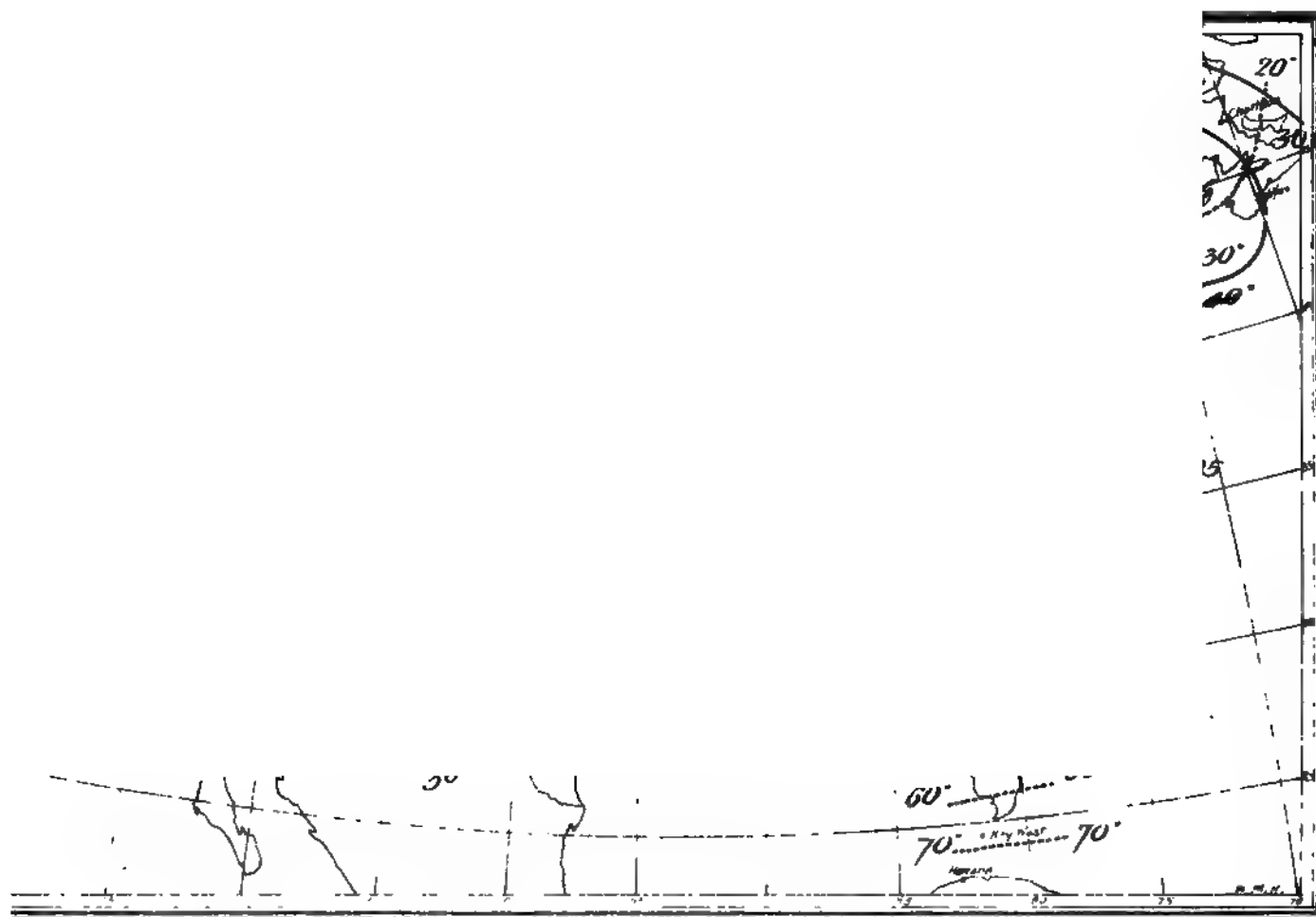


Chart DCCCCXIV.

December 8, 1900—8 p. m.

Chart D0000LXV.

December 22, 1900—8 a. m.

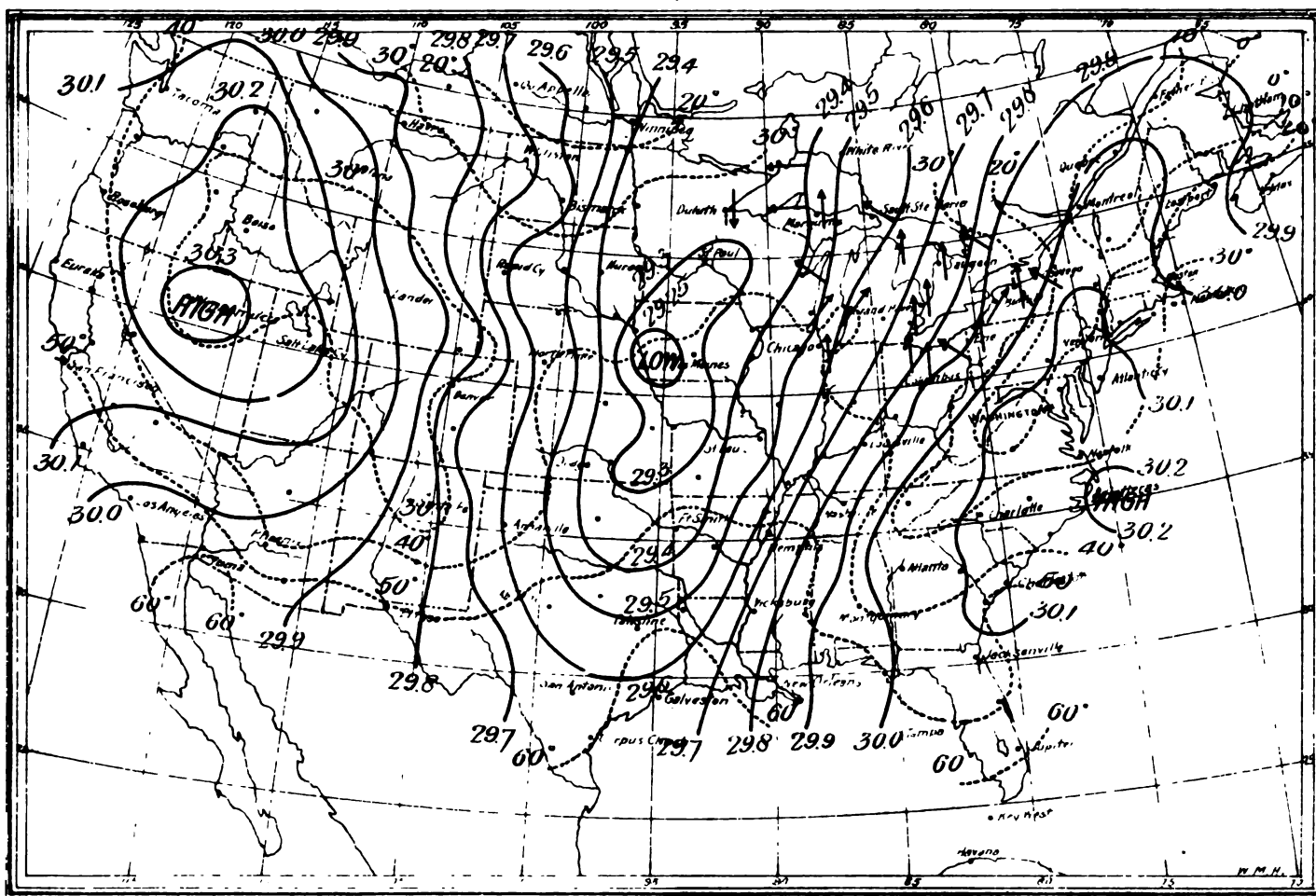


Chart D0000LXVI.

December 22, 1900—8 p. m.

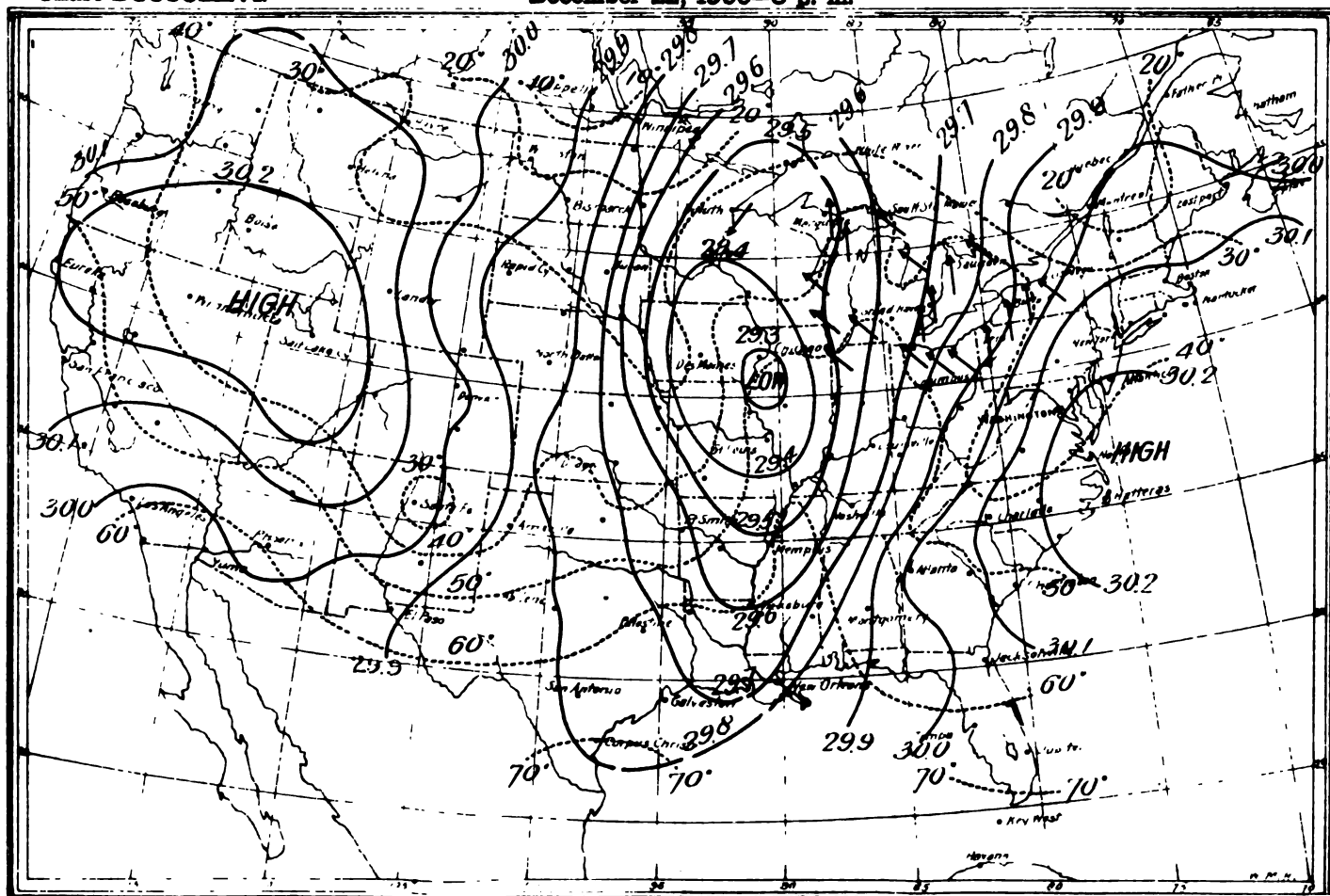


Chart D0000LXVII

December 28, 1900—8 a. m.

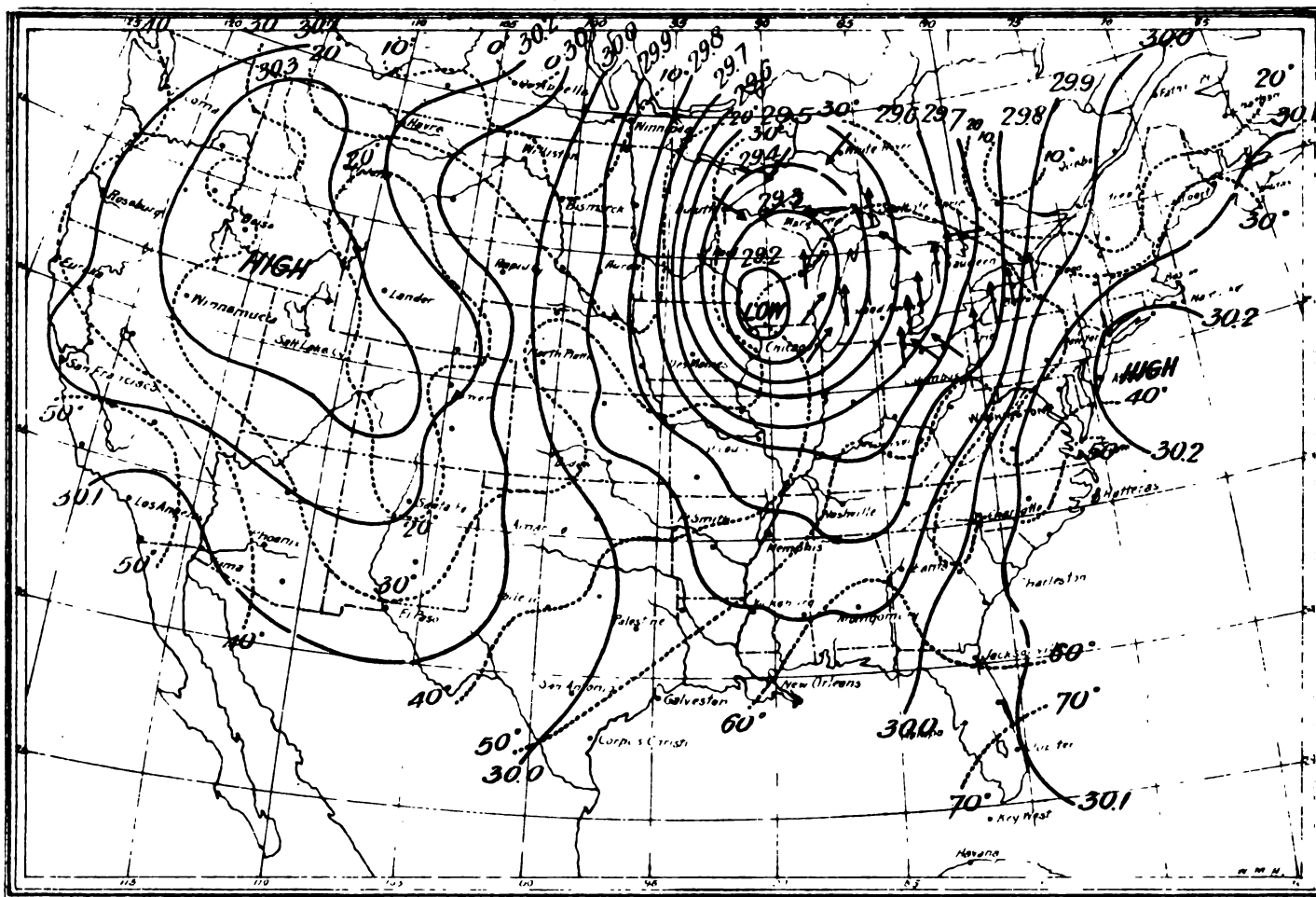
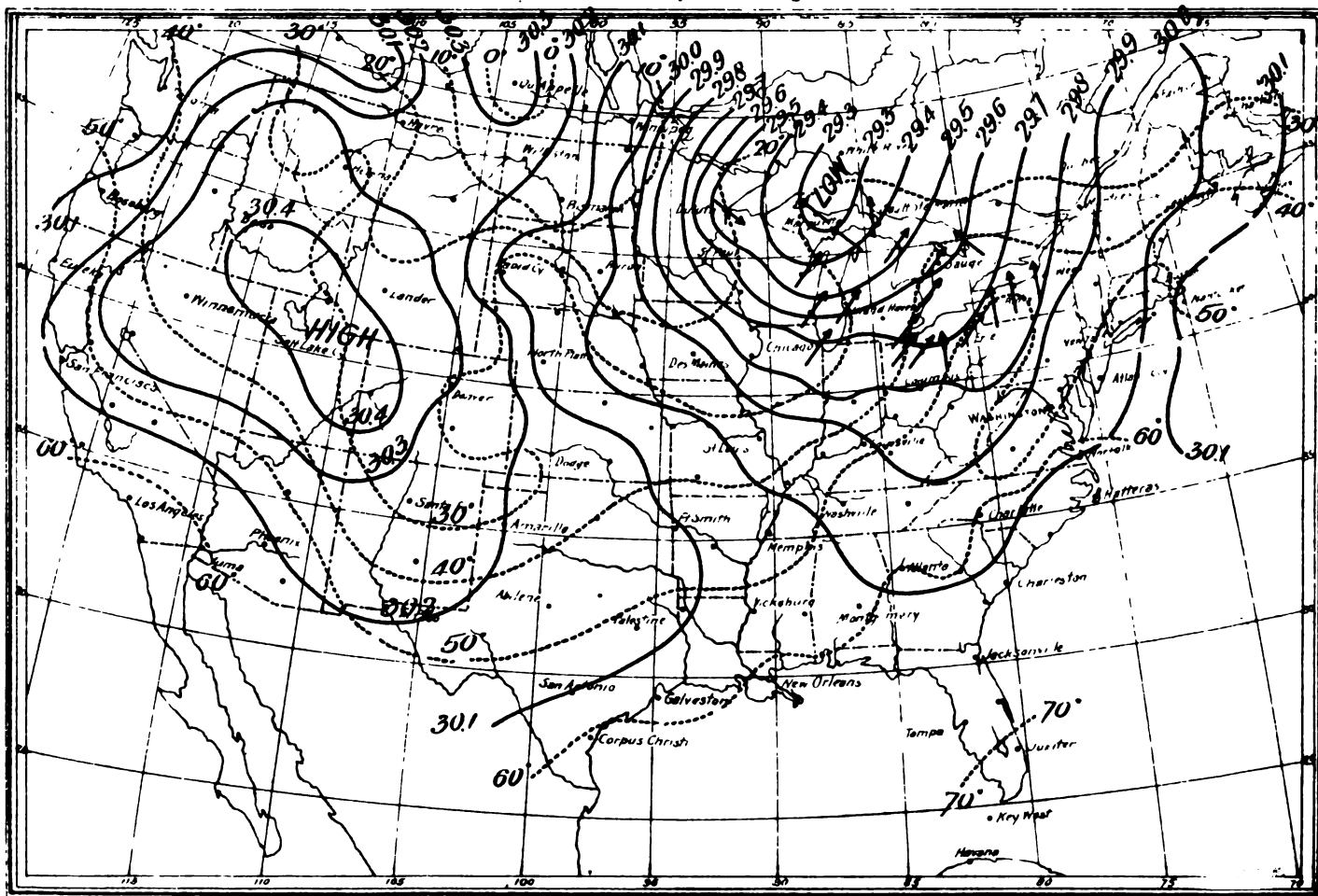


Chart D0000LXVIII

December 28, 1900—8 p. m.



W. B. No. 288.

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STORMS OF THE GREAT LAKES.

BY

E. B. GARRIOTT,

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Prepared under direction of WILLIS L. MOORE, Chief U. S. Weather Bureau.

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1903.

